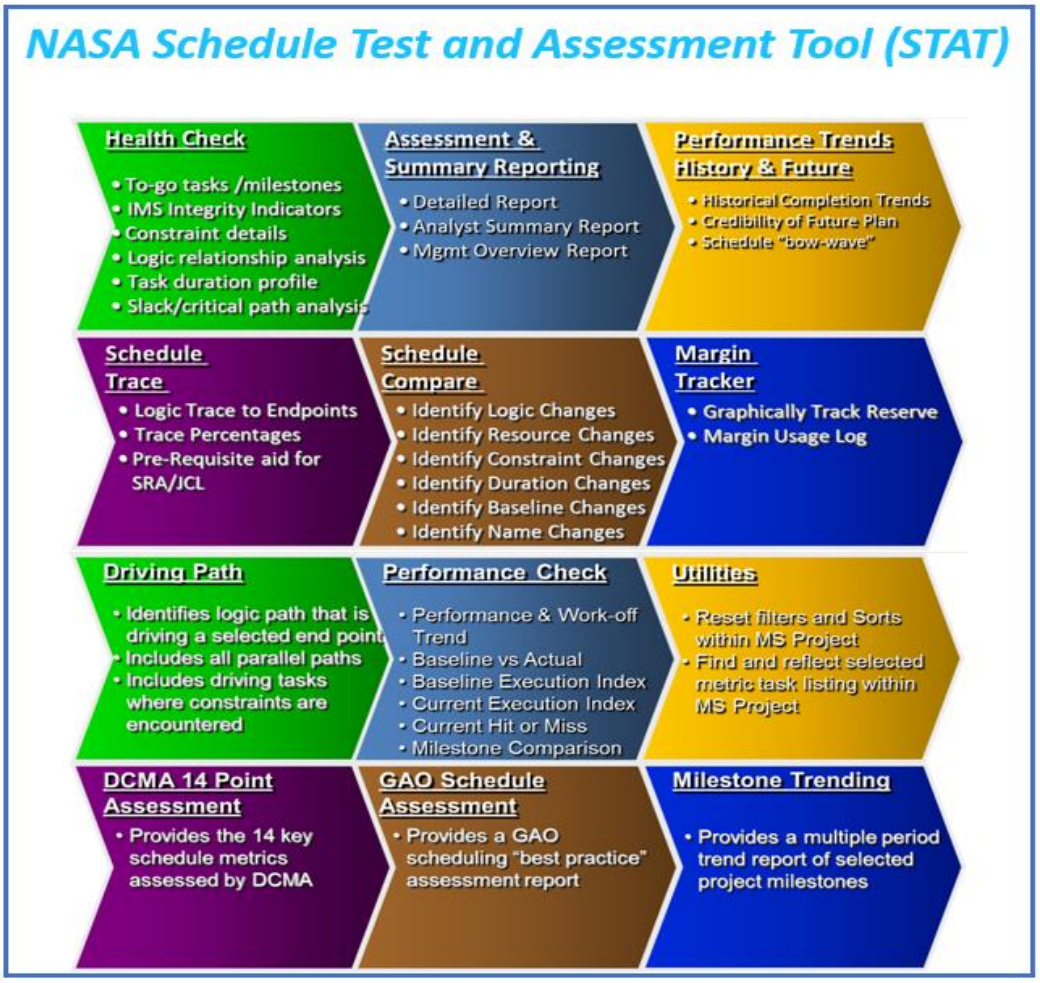
Schedule Test and Assessment Tool (STAT)

STAT 5.0 User's Guide



June 2016

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Section 1: Overview and Purpose

Sound schedule management involves the establishment, utilization, and control of a baseline master schedule. Schedule management at the project level entails the creation of an Integrated Master Schedule (IMS) that contains a logic network made up of tasks and milestones, interdependency relationships, task durations, and valid date constraints. The IMS provides the framework for time phasing and coordinating all project efforts into a master plan to ensure that objectives are accomplished within project or program commitments. With the IMS playing such a critical role in achieving project success, it is crucial for project schedules to provide accurate and meaningful planning data for all levels of management oversight within both NASA (National Aeronautics and Space Administration) and its contractor community. Regardless of the type of project being implemented it is essential that the IMS contains credible schedule data that addresses the total scope of work at a level of detail to allow for discrete progress measurement, management visibility, and critical path identification and control. This approach provides management with greater schedule visibility and the capability to accurately plan necessary resources when needed to accomplish the work.

Schedule credibility can be determined by monitoring key indicators within an IMS that reflect both good and poor characteristics in the areas of schedule structure, maintenance, and performance. These indicators are based on both the accepted rules of logic network development used in critical path method (CPM) scheduling techniques, and also the performance trending criteria established by the Office of Primary Responsibility for Project Planning and Control (PP&C) at Marshal Space Flight Center (MSFC).

The Schedule Test and Assessment Tool (STAT), version 5.0 is a schedule assessment application designed specifically to be an add-on for Microsoft Project. It was created to assist the scheduling community in the identification, measurement, and rating of key credibility indicators contained within a project IMS or any subset of a project schedule. By monitoring key indicators and incorporating necessary corrections, the STAT tool aids in the development of accurate project schedules, and also in the assessment of credibility within existing in-house and contractor schedules. This tool was also created to bring about greater efficiency in the development, assessment, and analysis of project schedules.

STAT 5.0 was developed by NASA at the Marshall Space Flight Center (MSFC) in Huntsville, AL. Distribution of the STAT software is managed by the Technology Development and Transfer Office (ZP30) at MSFC. This software is currently available for general public release. To request a copy of the STAT software, go to the NASA Software Catalog using the following link <https://software.nasa.gov/software/MFS-33362-1>.

Section 2: Software Installation

Installation Instructions:

While the STAT tool is not a commercially developed application, it has been developed and packaged so that installation and operation processes are much the same as any commercial software product. The STAT version 5.0 will work with Microsoft (MS) Project 2007, 2010, 2013, and 2016. Installing the STAT application can be accomplished by following the steps provided below.

Note: When installing the STAT software, Microsoft Project must be closed.

Step One:

When the software has been received, save the STAT zip file to a desired folder.

Step Two:

If an earlier version of the STAT application exists on your personal computer then removal of that version is required first. This can be accomplished by making the following selections:

Windows XP

- Select **Start**
- Select **Settings**
- Select **Control Panel**
- Select **Add/Or Remove Programs**
- Select **STAT - - Tools Suite**
- Select **Remove**

Windows 7

Select **Start icon** 
Select **Control Panel**
Select **Programs and Features**
Select **STAT - - Tools Suite**
Select **Uninstall**

Additionally, anyone who has previously installed the earlier "Schedule Health" macros, provided by the Marshall Space Flight Center (MSFC), must also remove that set of macros from the Microsoft Project application prior to installing STAT. This can be accomplished by making the following selections:

Microsoft Project 2007

- Select **Tools**
- Select **Macro**
- Select **Macros**
- Select **Macro for "old" Health Check**
- Select **Delete**

Microsoft Project 2010

Select **View**
Select **Macros**
Select **Macro for "old" Health Check**
Select **Delete**

Step Three:

For Windows 7 open the zip file and then open the folder inside to reveal the two files and the folder (e.g.,"ProjToolsAddinSetup.msi","setup.exe" and "Office2007PIARedist"). See Figure 2-1. For Windows XP users unzip the STAT file by selecting "Extract". Two files and a folder will be extracted to the designated folder.

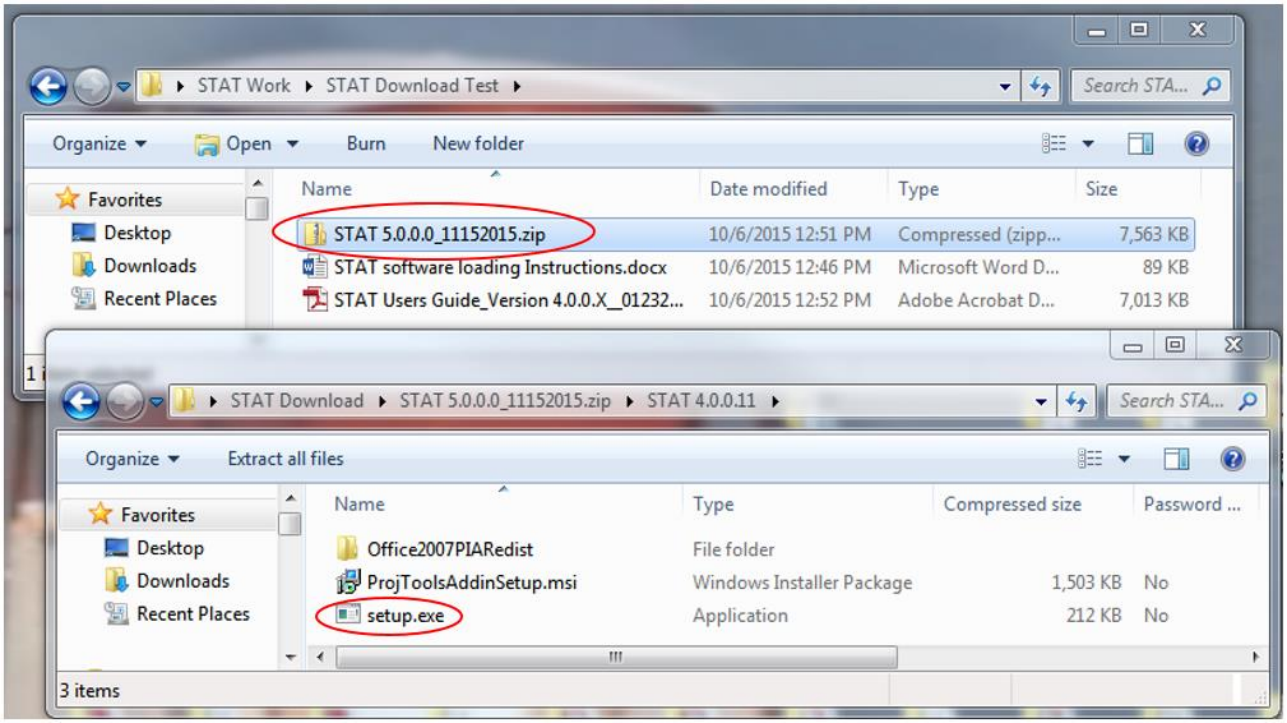


Figure 2-1: STAT Unzip and Installation Guidance

Step Four:

Select and execute the setup.exe file.

Step Five:

Follow the on-screen instructions provided during the installation.

Step Six:

Verify that the STAT toolbar is visible by opening MS Project (versions 2007, 2010 or 2013) the STAT toolbar should have 14 selection buttons – Health Check, SASR, Trend Analysis, Schedule Comparison, Schedule Trace, Margin Tracker, Schedule Performance, Driving Path, DCMA 14 Point, GAO BP, Milestone Trending, Show in Schedule Utility, Filter Sort Reset and About). See Figure 2-2 for an example of MS Project version 2007. The toolbar will be in the Add-Ins Tab in MS

Project 2010 and 2013. Figure 2-3 is an example of MS Project 2010 and 2013. The selection button labeled “About” will indicate the version of STAT.

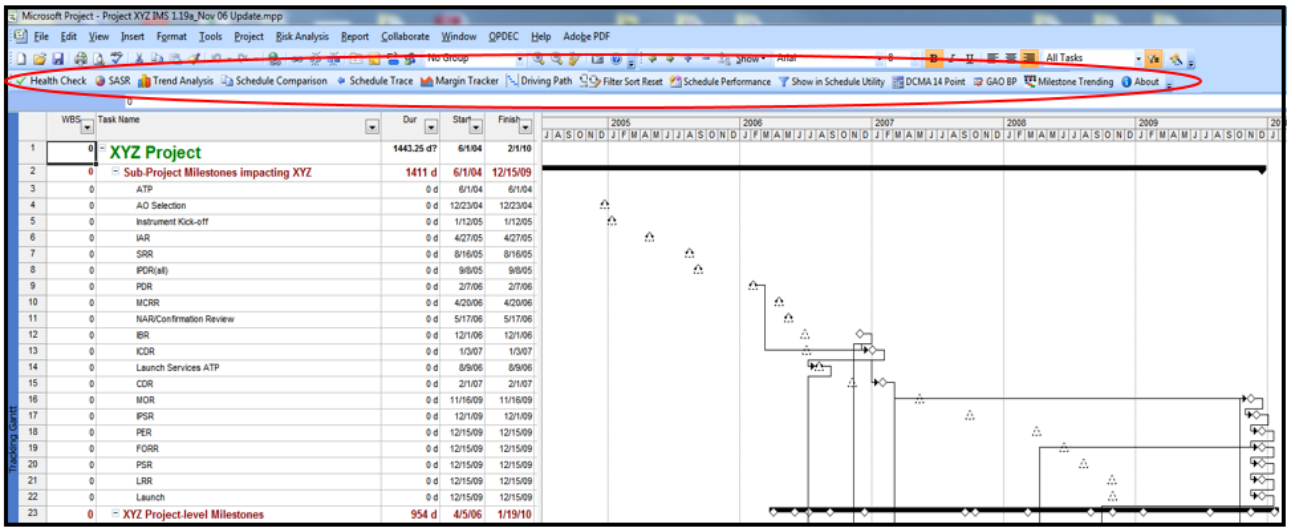


Figure 2-2: STAT Toolbar Icons after Installation (MS Project 2007)

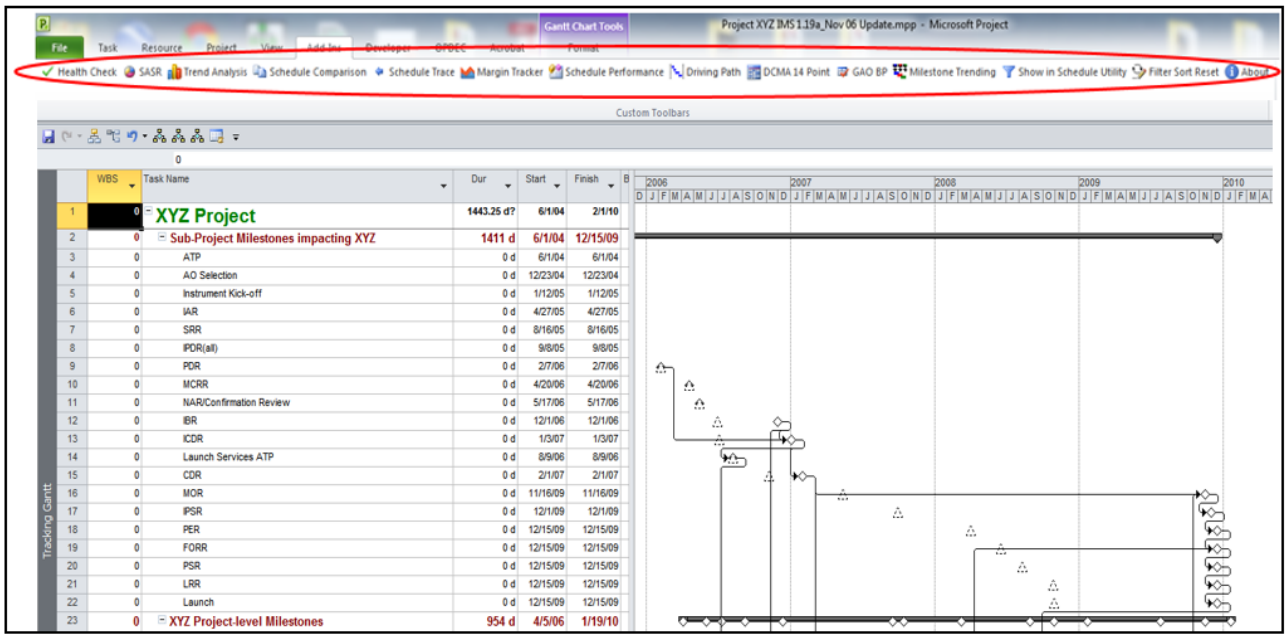


Figure 2-3: STAT Toolbar Icons after Installation (MS Project 2010 and 2013)

Step Seven: Check the settings for Legacy Formats, they should be set as shown in Figure 2-4. To access this setting in MS Project go to File> Options> Trust Center> Trust Center Settings> Legacy Formats> and be sure “Allow loading files with legacy or non-default file formats.” Is checked.

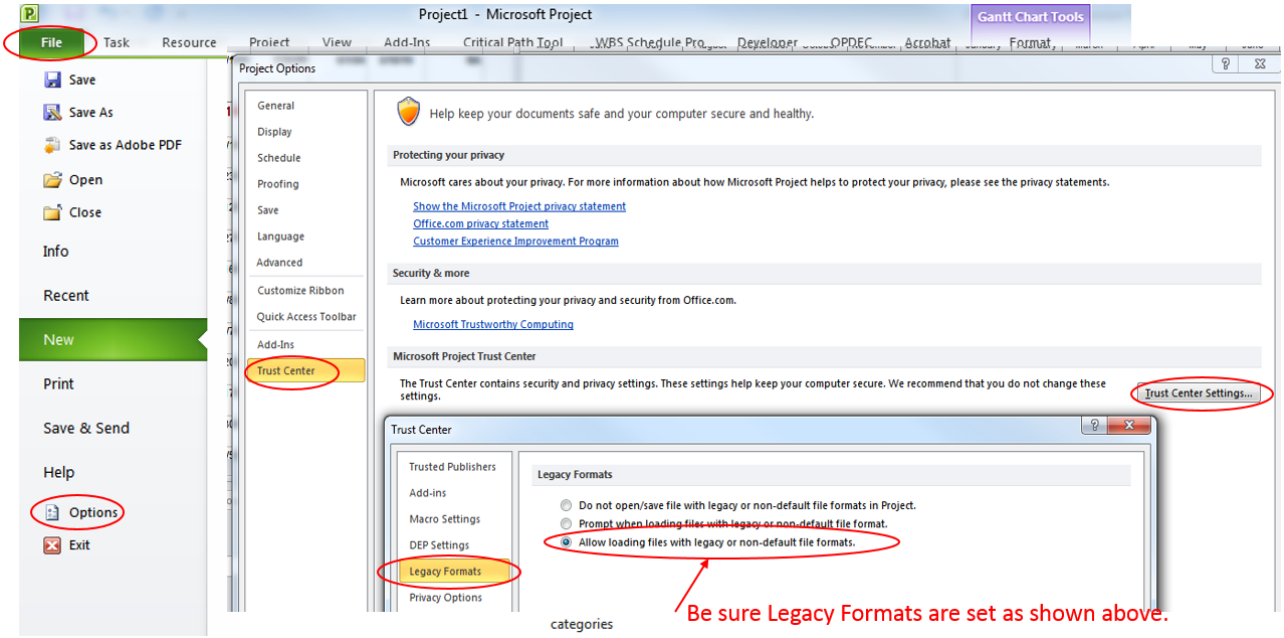


Figure 2-4: Settings to allow Legacy Formats

Section 3: The Schedule Health Check

Initiating the Schedule Health Check:

The purpose of the Health Check is to provide the user a very quick assessment of schedule soundness and credibility. Schedule integrity is determined by monitoring key indicators within an Integrated Master Schedule (IMS) that reflect both good and poor characteristics of schedule structure and maintenance. Examples of key indicators within an IMS logic network that must be monitored include the following: number of missing predecessors and successors, out of sequence task relationships, number of task constraints, omission of task status, actuals after the status date, logic ties to/from summary tasks, relationship types and negative/positive lag, improperly reflecting tasks as milestones, slack analysis, remaining duration analysis, and critical path analysis. These indicators are based on standard rules of logic network development utilized in critical path method (CPM) scheduling techniques. The automated Schedule Health Check assists in quickly monitoring and assessing these key indicators within a project schedule. To initiate this assessment function, select the Health Check icon from the MS Project toolbar. Note: The toolbar is found on the "Add-Ins" tab in Microsoft Project 2010. The icon initiates the Schedule Health Check Wizard. This wizard leads the user through four simple steps to produce a Schedule Health Check output report.

Step 1 produces a wizard dialogue box that allows the user to set the schedule "Status Date" on which the resulting Health Check data will be based. *Note: The schedule should have a Status Date that represents the "as-of" date which the schedule was updated through*. If the date is missing or obviously incorrect it should be added/changed. Also the user can select the desired baseline version to use in determining the correct schedule baseline information. The version denoted as "Baseline"

is the default, if no other version is selected. Baseline versions 1-10 can also be selected. After selecting the desired status date and baseline click "Next" (see Figure 3-1).

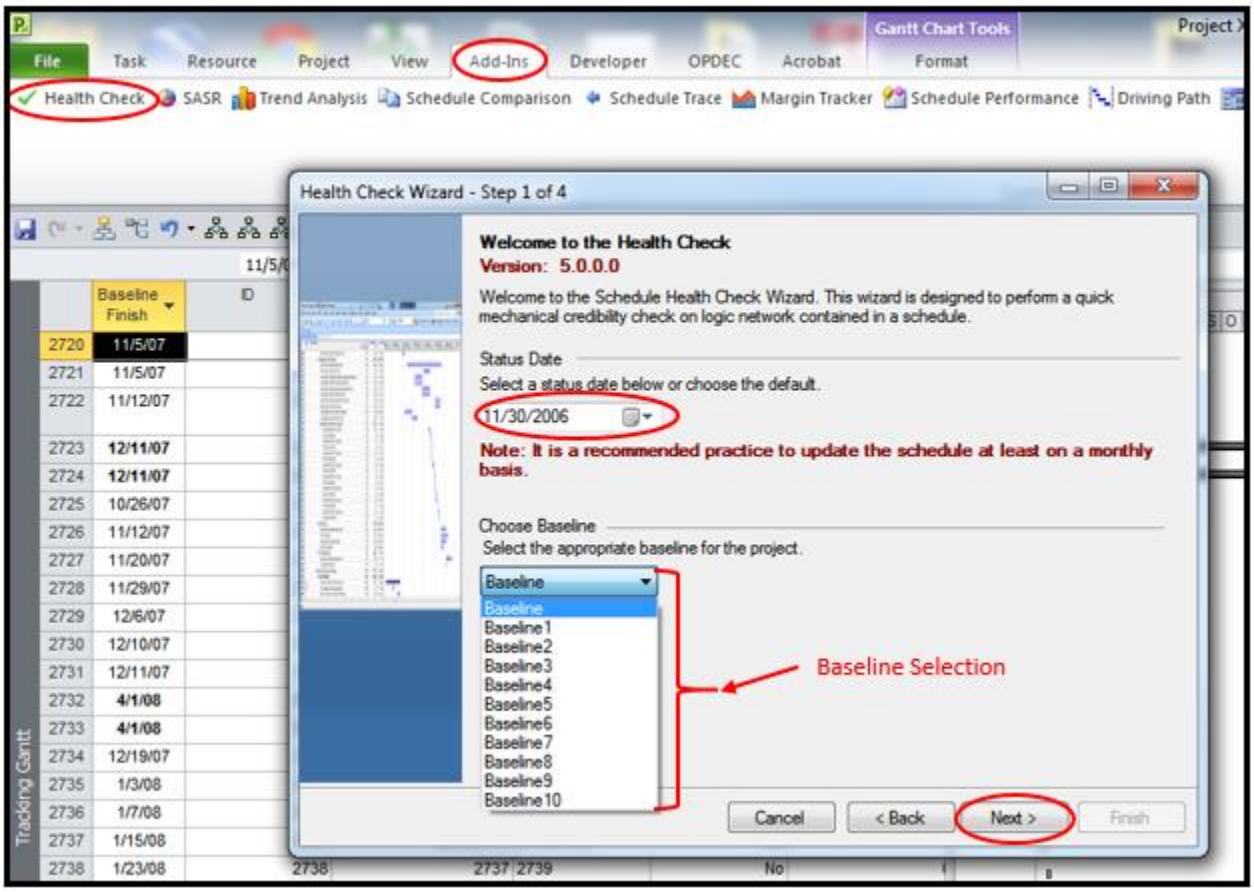


Figure 3-1: Health Check Wizard - Step 1

Step 2 of the Health Check Wizard produces a dialogue box (see Figure 3-2). This step of the wizard also allows the user to select the appropriate descriptive indicators that apply to the schedule data being assessed if known. The indicator choices include the following: "Is the current schedule traceable to a Work Breakdown Structure?", and "Does the current schedule have a credible critical path?" If the information is not yet known for either of these questions, the user can continue by leaving the default selections (to be determined) in place and make the corrected choices at a later time. The filter selection allows the user to use the currently set filters or use no filters. Use No Filters is the default setting and will remove all filters and analyze the complete schedule. If the Use Current Filters is selected the filter that is set in the schedule and any Auto Filters will remain in effect and only the selected portion of the schedule will be analyzed. To continue to Step 3 of the Health Check wizard, click "Next".

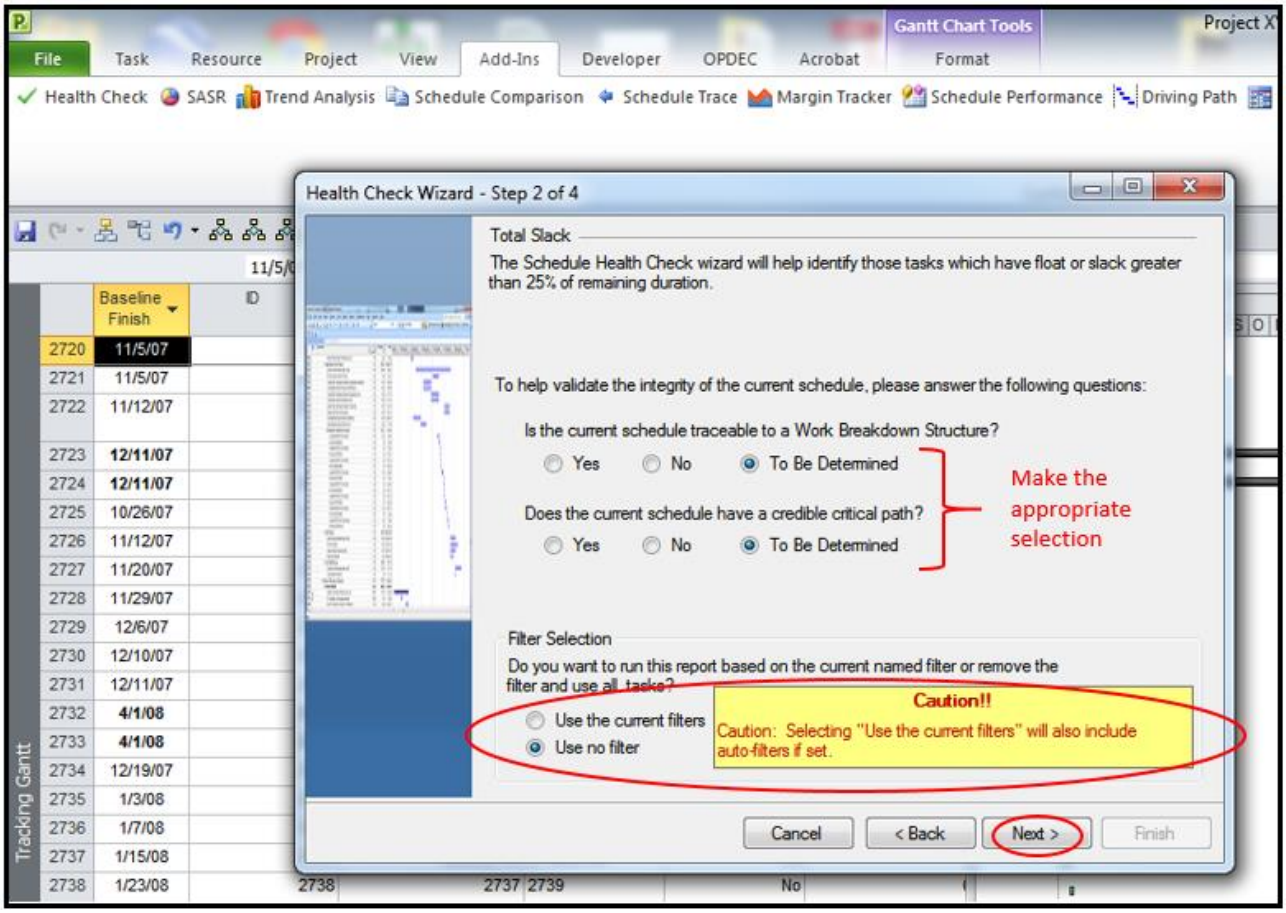


Figure 3-2: Health Check Wizard - Step 2

Step 3 of the Health Check Wizard produces a dialogue box (see Figure 3-3) that provides the user the option of receiving Health Check results reflecting only the most recent run or a comparison of results for both, the most recent run and a previous Health Check run. *Note: if the comparison option is selected, the user must select the desired previous Health Check file, to be used in the comparison. Use the Browse button to select the desired file.*

The step 3 dialogue box also provides a browse function to allow the user to select the location where they wish the final output file to be stored.

After selecting the desired Step 3 choices, click "Next".

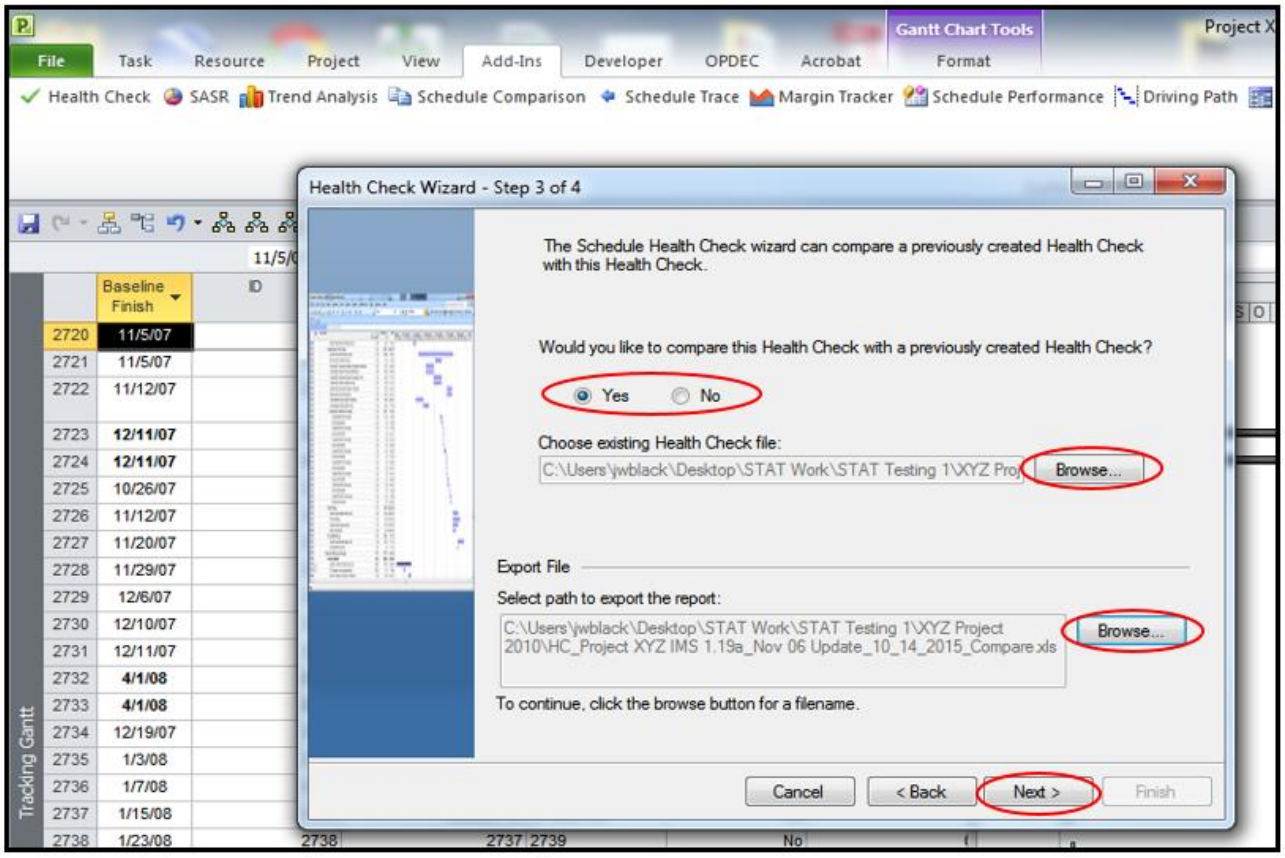


Figure 3-3: Health Check Wizard - Step 3

Step 4 of the Health Check Wizard produces a final dialogue box (see figure 3-4) that allows the user to complete the final step in initiating the Schedule Health Check. This dialogue box informs the user that Microsoft Excel 2000 or later must be installed. The user is also informed that the processing time for transferring the Health Check data results into the Excel template may take several minutes if the schedule file size is very large. A progressing status will be shown after the Finish button is clicked showing the progress of the Health Check.

Click "Finish" to start the Schedule Health Check processing and compilation of assessment data. After starting, this process cannot be stopped by the Cancel button on the wizard.

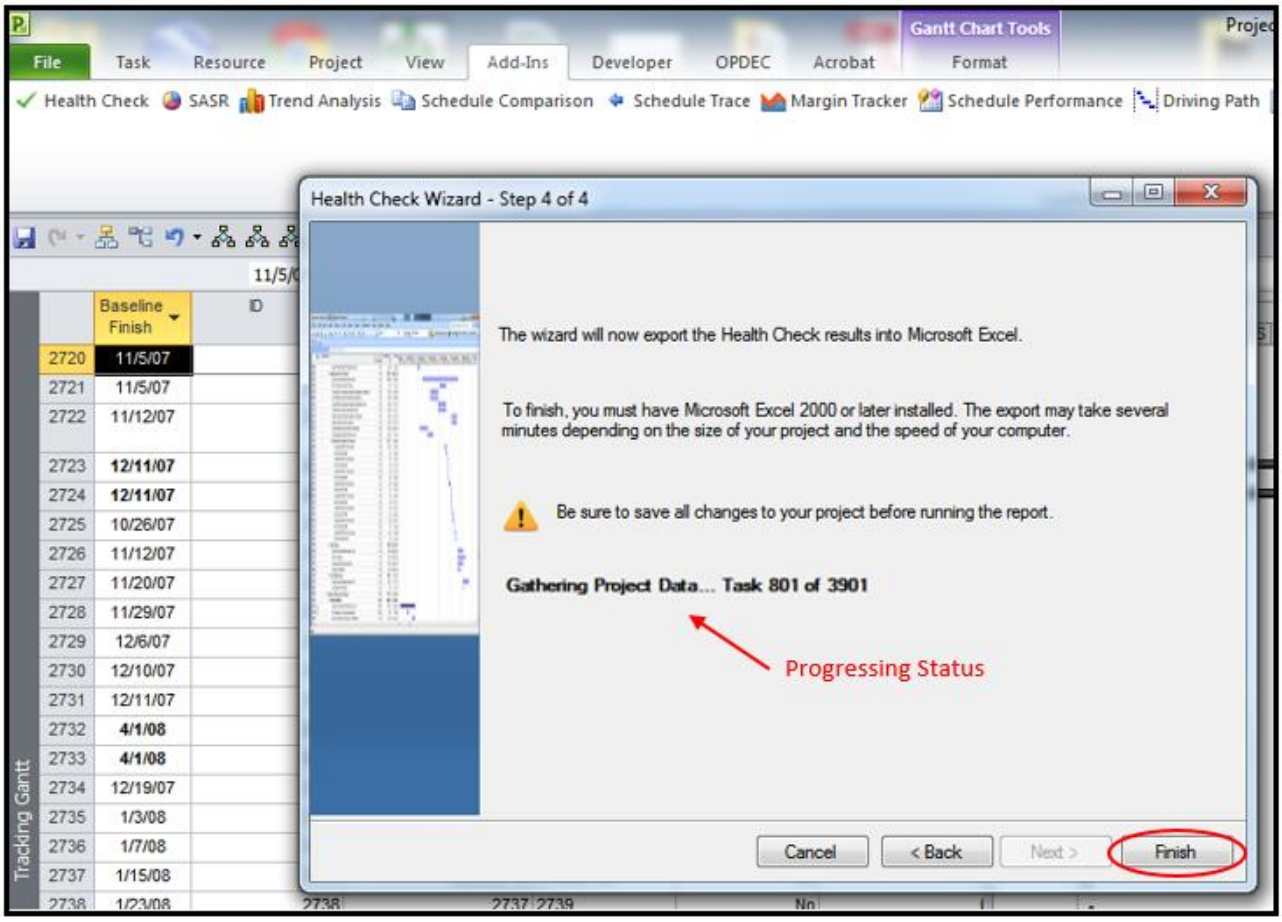
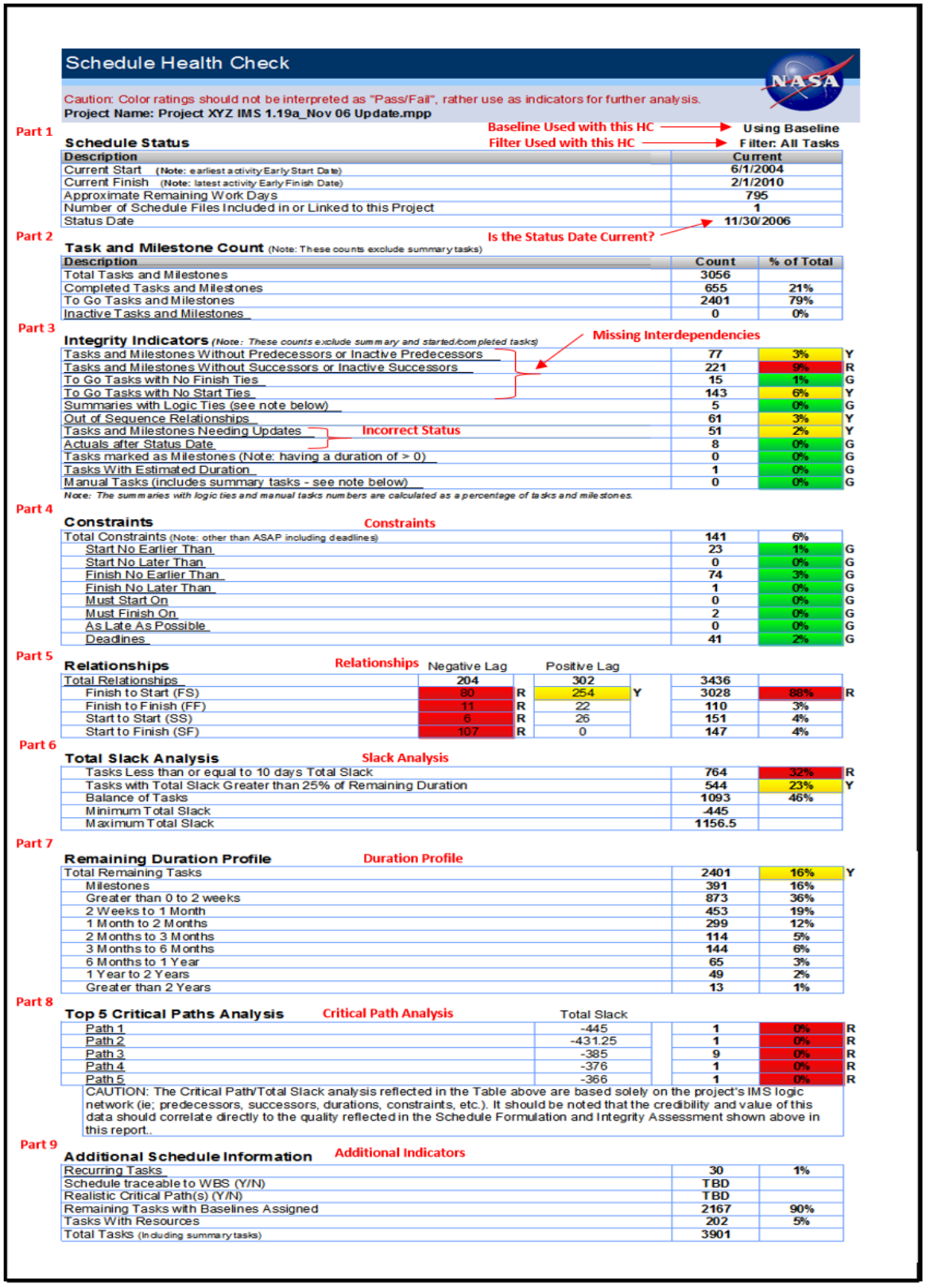


Figure 3-4: Health Check Wizard - Step 4

Understanding Schedule Health Check Results:

Credibility indicators, noted earlier in this section, should be identified and tabulated routinely using the Schedule Health Check on all detailed schedule tasks and milestones in the IMS that are not yet complete. Critical Path Method (CPM) scheduling guidelines call for logic networks to be structured so that all detailed tasks and milestones have accurate predecessor and successor relationships assigned. Additionally, it is important that minimal fixed task constraints be included within the IMS, with only those having a valid purpose being assigned and used in a logic network. It is also critical that an accurate reflection of current status (including new forecast dates for behind-schedule tasks) for all "to-go" tasks and milestones be reflected in the IMS. It is important that no task or milestone be left without progress prior to the current status date in the IMS. The higher the number of instances where these guidelines are not followed in the IMS, the more improbable it is to accurately identify the true critical path within a project schedule. It also indicates that the overall schedule lacks credibility in the data output that it produces. The Health Check assessment process additionally provides the basic statistics of the IMS content such as current number of total tasks, number of completed tasks, number of remaining tasks, current completion date, status date, and the number of remaining work days in the schedule. This information should be compared after each update to aid in understanding what changes have occurred since the last IMS update.

The older versions of the Health Check had an overall stoplight rating but it was removed because it was being used as a pass/fail and people were missing the true purpose of the health check. The purpose of the health check is to find potential problems that need to be fixed or explain why the practice is needed in this particular IMS. The red, yellow, green colors on each element are just an indication of the potential problem this area could be to the integrity of the IMS. Each one of the items that make up the number by the colored indicator needs to be investigated. Figure 3-5 reflects the Health Check results on a single schedule file, while Figure 3-6 illustrates the comparison of results from a current schedule file to a previous version of the same project schedule. The tabulation of these indicators is formatted in an Excel template that provides assessment results in a simple display that is easily understood by project schedulers. It is generally recommended that Health Check assessment results be presented and explained to the project manager and other appropriate team members. This will help the project management team to gain a clear understanding regarding the quality and credibility of their project IMS. The assessment results should also assist in getting schedule weaknesses corrected so that the IMS can serve as a credible management tool. The stoplight rating criteria which is applied within the Health Check assessment function is shown in (Figure 3-7). This provides the user with an understanding of the criteria ranges that are associated with each stoplight rating.



Schedule Health Check

Caution: Color ratings should not be interpreted as "Pass/Fail", rather use as indicators for further analysis.

Project Name: Project XYZ IMS 1.19a_Nov 06 Update.mpp

Part 1

Baseline Used with this HC → Using Baseline

Filter Used with this HC → Filter: All Tasks

Schedule Status

Description	Current
Current Start (Note: earliest activity Early Start Date)	6/1/2004
Current Finish (Note: latest activity Early Finish Date)	2/1/2010
Approximate Remaining Work Days	795
Number of Schedule Files Included in or Linked to this Project	1
Status Date	11/30/2006

Part 2

Is the Status Date Current?

Task and Milestone Count (Note: These counts exclude summary tasks)

Description	Count	% of Total
Total Tasks and Milestones	3056	
Completed Tasks and Milestones	655	21%
To Go Tasks and Milestones	2401	79%
Inactive Tasks and Milestones	0	0%

Part 3

Integrity Indicators (Note: These counts exclude summary and started/completed tasks)

Missing Interdependencies

Incorrect Status

Tasks and Milestones Without Predecessors or Inactive Predecessors	77	3%	Y
Tasks and Milestones Without Successors or Inactive Successors	221	9%	R
To Go Tasks with No Finish Ties	15	1%	G
To Go Tasks with No Start Ties	143	6%	Y
Summaries with Logic Ties (see note below)	5	0%	G
Out of Sequence Relationships	61	3%	Y
Tasks and Milestones Needing Updates	51	2%	Y
Actuals after Status Date	8	0%	G
Tasks marked as Milestones (Note: having a duration of > 0)	0	0%	G
Tasks With Estimated Duration	1	0%	G
Manual Tasks (includes summary tasks - see note below)	0	0%	G

Note: The summaries with logic ties and manual tasks numbers are calculated as a percentage of tasks and milestones.

Part 4

Constraints

Constraints

Total Constraints (Note: other than ASAP including deadlines)	141	6%	
Start No Earlier Than	23	1%	G
Start No Later Than	0	0%	G
Finish No Earlier Than	74	3%	G
Finish No Later Than	1	0%	G
Must Start On	0	0%	G
Must Finish On	2	0%	G
As Late As Possible	0	0%	G
Deadlines	41	2%	G

Part 5

Relationships

Relationships

	Negative Lag		Positive Lag				
Total Relationships	204		302		3436		
Finish to Start (FS)	80	R	254	Y	3028	88%	R
Finish to Finish (FF)	11	R	22		110	3%	
Start to Start (SS)	6	R	26		151	4%	
Start to Finish (SF)	107	R	0		147	4%	

Part 6

Total Slack Analysis

Slack Analysis

Tasks Less than or equal to 10 days Total Slack	764	32%	R
Tasks with Total Slack Greater than 25% of Remaining Duration	544	23%	Y
Balance of Tasks	1093	46%	
Minimum Total Slack	-445		
Maximum Total Slack	1156.5		

Part 7

Remaining Duration Profile

Duration Profile

Total Remaining Tasks	2401	16%	Y
Milestones	391	16%	
Greater than 0 to 2 weeks	873	36%	
2 Weeks to 1 Month	453	19%	
1 Month to 2 Months	299	12%	
2 Months to 3 Months	114	5%	
3 Months to 6 Months	144	6%	
6 Months to 1 Year	65	3%	
1 Year to 2 Years	49	2%	
Greater than 2 Years	13	1%	

Part 8

Top 5 Critical Paths Analysis

Critical Path Analysis

	Total Slack			
Path 1	-445	1	0%	R
Path 2	-431.25	1	0%	R
Path 3	-385	9	0%	R
Path 4	-376	1	0%	R
Path 5	-366	1	0%	R

CAUTION: The Critical Path/Total Slack analysis reflected in the Table above are based solely on the project's IMS logic network (ie; predecessors, successors, durations, constraints, etc.). It should be noted that the credibility and value of this data should correlate directly to the quality reflected in the Schedule Formulation and Integrity Assessment shown above in this report..

Part 9

Additional Schedule Information

Additional Indicators

Recurring Tasks	30	1%
Schedule traceable to WBS (Y/N)	TBD	
Realistic Critical Path(s) (Y/N)	TBD	
Remaining Tasks with Baselines Assigned	2167	90%
Tasks With Resources	202	5%
Total Tasks (Including summary tasks)	3901	

Figure 3-5: Health Check Assessment Results Output

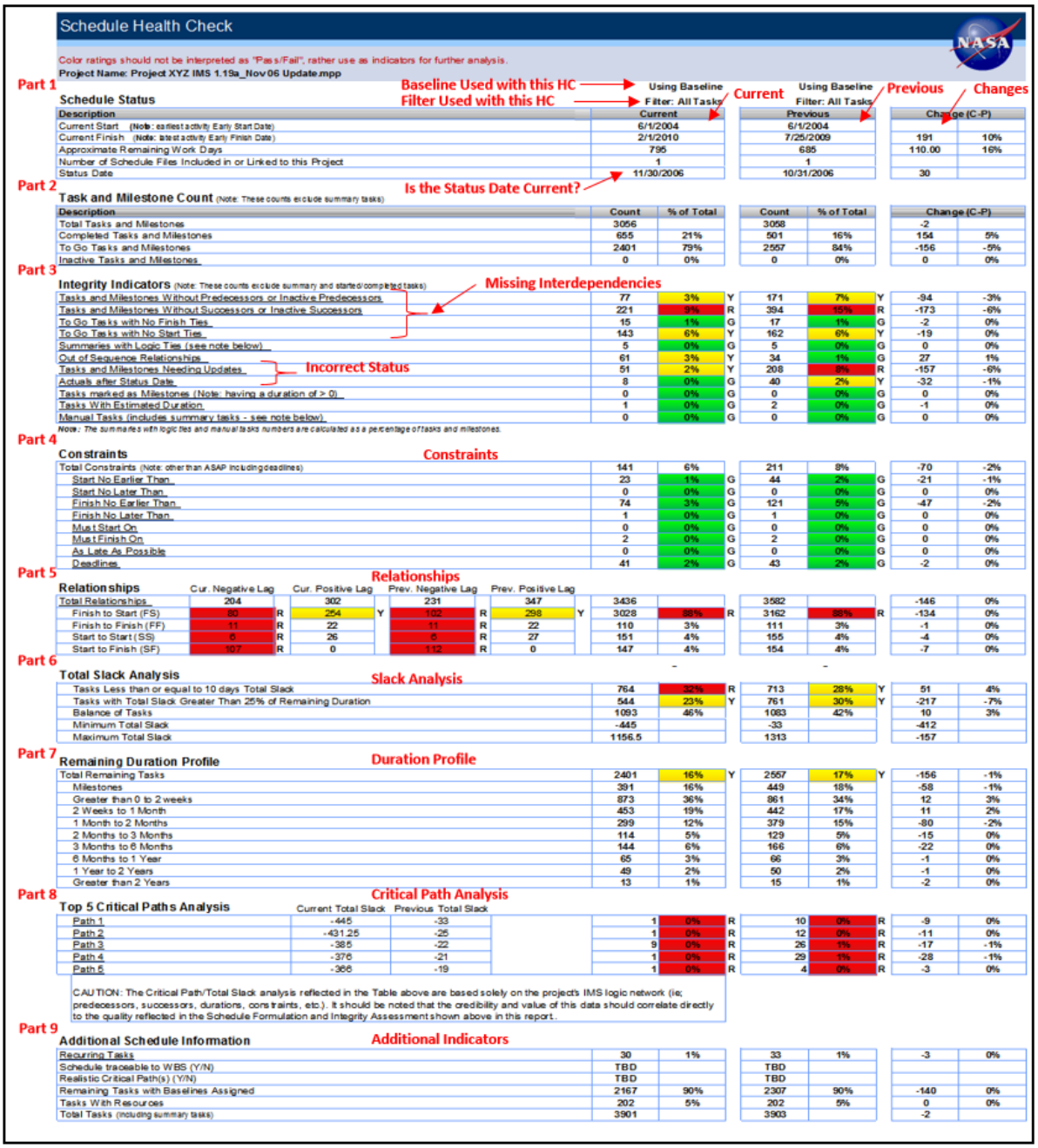


Figure 3-6: Health Check Comparison Assessment to Previous Results

Stoplight Criteria

1. For missing predecessors and successors: less than 3% is green, from 3% to 7% is yellow, and greater than 7% is red.
2. For tasks with no finish or start ties: less than 3% is green, from 3% to 7% is yellow, and greater than 7% is red.
3. For summary tasks with logic ties: less than 2% is green, from 2% to 3% is yellow, and greater than 3% is red.
4. For out of sequence relationships: less than 2% is green, from 2% to 3% is yellow, and greater than 3% is red.
5. For tasks needing updates, actuals after the status date, tasks marked as milestones, and manual mode calculated tasks: 0% is green, greater than 0% up to 5% is yellow, and over 5% is red.
6. For tasks with estimated durations: less than 3% is green, from 3% to 7% is yellow, and greater than 7% is red.
7. For start no earlier than and finish no earlier than constraints: less than 10% is green, from 10% to 15% is yellow, and greater than 15% is red.
8. For start no later than and finish no later than, must start on, must finish on, as late as possible, and deadlines constraints: less than 3% is green, from 3% to 7% is yellow, and greater than 7% is red.
9. For relationships with negative lag: 0 negative lag relationships is green and anything greater than 0 is red.
10. For finish to start relationships with positive lag: less than 5% is green, from 5% to 10% is yellow, and greater than 10% is red.
11. For total finish to start relationships: greater than 95% is green, 91% to 95% is yellow, and less than 91% is red.
12. For total slack less than 10 days and greater than 25% remaining duration: less than 16% is green, from 16% to 30% is yellow, and greater than 30% is red.
13. For remaining durations greater than two months: less than 10% is green, from 10% to 20% is yellow, and greater than 20% is red.
14. For critical paths: total slack less than 0 days red, 0 days to 20 days is yellow, and greater than 20 days is green.

Figure 3-7: Schedule Health Check Stoplight Criteria and Weighting

The Health Check output provides the capability for viewing current assessment results only, or for comparing current results to those of any previous Health Check assessment. This will provide the user with the capability of tracking and presenting improvement details for schedule quality and credibility. The output format structures the data results into nine parts.

Part one provides general schedule status information relative to project start and forecast finish dates, how many work days are remaining in the project, number of schedule files included or linked to this project, and the project status date. Also the Baseline being used and the Filter being used in this analysis is shown above this section. It should be noted that, regardless if there are external interdependencies included in the schedule logic, the Health Check will still perform the assessment in the same manner as if there were only one project schedule file. Additionally, it is important for

users to check the status date and ensure that the correct date is identified from which key portions of the assessment will be based. Keep in mind that a project schedule that reflects an incorrect or old status date is considered suspect for any further schedule analysis.

Part two provides information on the size of the project schedule relative to how many total tasks and milestones are included, how many are already completed, how many tasks/milestones remain to be worked and how many tasks have been made inactive. A task can be flagged as "inactive" indicating it cannot be progressed and the logic is ignored in CPM calculations, watch these tasks carefully, a listing is provided in a separate tab of the excel workbook. Please remember that the numbers tabulated in this section only include detailed tasks and milestones. No summary tasks are counted in these totals because the details are of primary importance when assessing schedule status and credibility. Summary tasks should always be driven and determined by the detailed tasks and milestones.

Part Three is the primary assessment portion of the Schedule Health Check. Crucial schedule logic credibility indicators are identified and tabulated for the user's assessment. Specific assessment criteria has been established and built into the STAT software for determining the stoplight ratings. Each of the following indicators have a listing of the activities counted in a separate tab of the excel workbook. The following detailed explanations are provided for Part Four indicators:

- ***"Tasks and Milestones without Predecessors"*** – This indicator is very straight forward and provides a detailed count of all tasks/milestones that have no predecessor assignments in the IMS. Keep in mind that when a task or milestone does not have a predecessor assigned then, unless there is a valid constraint preventing its start, it should be scheduled to start immediately. If this is truly the case then this situation is fine, however, this is not typically the case. To accurately model a planned project implementation, the correct sequence must be identified for each task and milestone contained in the schedule. This will allow the automated scheduling tool to accurately calculate slack (float) for each task/milestone in the IMS which is required in order to correctly identify the project critical path. The Health Check correctly identifies all incomplete tasks/milestones that have no predecessor assignments so that they can be evaluated, and if necessary corrected. Tasks that have only inactive predecessors will also show up here.

- ***"Tasks and Milestones without Successors"*** – This explanation is nearly the same as the above indicator, except that when there is no successor assignment for a specific task or milestone, then that item may slip indefinitely with no impact to project completion. This situation also hinders correct slack calculation and critical path identification. Tasks that have only inactive successors will also show up here.

- "***To Go Tasks with No Finish Ties***" – This indicator identifies all tasks in the IMS that, even though they have successors assigned, have no finish successors. The tasks identified have only successors that are either *start-to-start* or *start-to-finish* type interdependencies. The impact of this type of interdependency is that the finish of the task involved may slip continuously with no resulting impact on the project completion. In other words, it has nearly the same impact as a task that has no successor assignments. See Figure 3-8 for example of this type of situation.

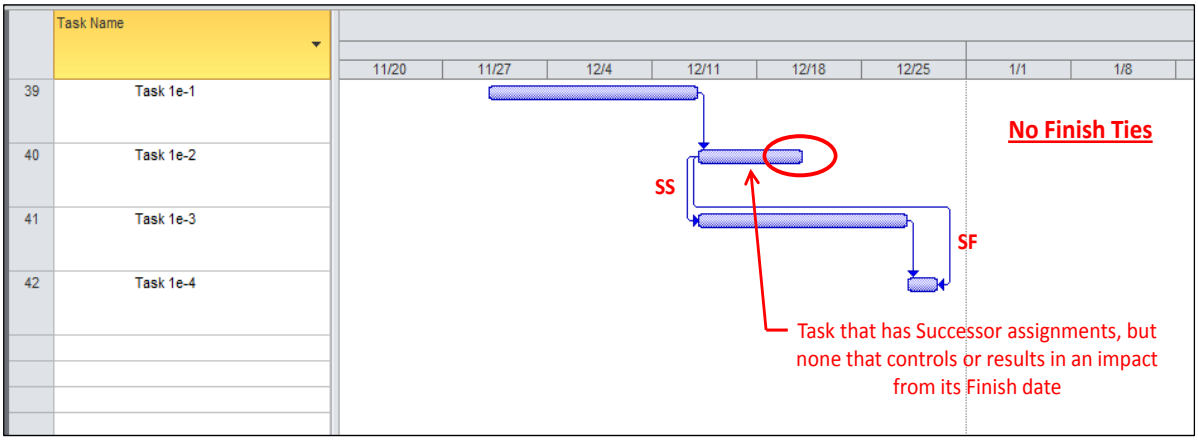


Figure 3-8 Tasks with No Finish Ties

- "***To Go Tasks with No Start Ties***" – This indicator identifies all tasks in the IMS that, even though they have predecessors assigned, have no start predecessor. The tasks identified have only predecessors that are either *finish-to-finish* or *start-to-finish* type interdependencies. The impact of this type of interdependency is similar to the impact as a task that has no predecessor assignments. See Figure 3-9 for example of this type of situation.

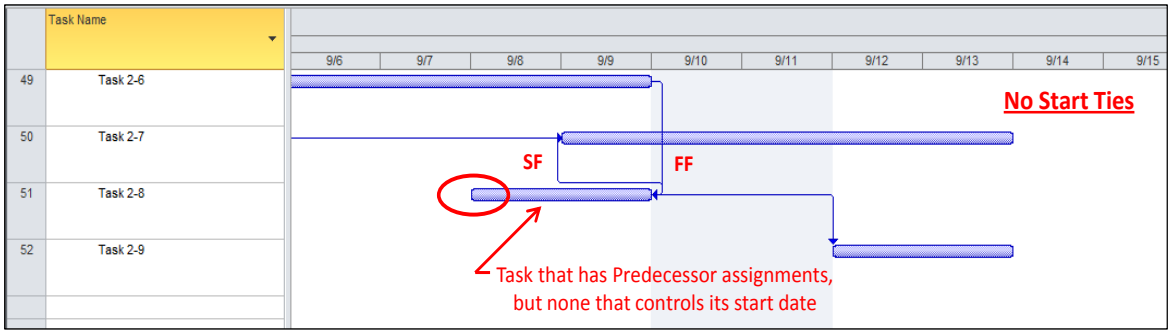


Figure 3-9 Tasks with No Start Ties

- ***"Summaries with Logic Ties"*** – Summary tasks should not be assigned sequence interdependencies. When this occurs, the summary task relationships will override the sequence relationships that exist on the detailed tasks and milestones that are contained under the summary task. Remember that detail task logic sequence should drive the summary task dates and not the other way around. The impact is potentially incorrect schedule dates and incorrect slack calculation.

- "***Out of Sequence Relationships***" – Out of sequence relationships occur when predecessor/successor assignments contained in the IMS become invalid due to actual start

or finish dates being input that conflict with the existing logic relationships. This means that an actual date that has been input on a task indicates that the task is in progress before the logic tie reflects that it could be. These situations should be reviewed and corrected with valid logic relationships, if needed, or possibly an actual date has been entered in error and requires a correction. The impact of this situation is that the total slack calculations on the involved tasks are incorrect and could potentially affect the accuracy of critical path identification.

- ***"Tasks and Milestones Needing Updates"*** – This credibility indicator identifies and counts all tasks and milestones that are reflecting a behind schedule progress of greater than ten days from the status date or any start or finish date behind the status date that does not have an actual date. The purpose of this indicator is to locate tasks and milestones that need correct progress applied or new forecast start and/or finish dates. The impact of leaving tasks/milestones without correct progress is incorrect slack calculations and incorrect schedule dates.

- ***"Actuals after Status Date"*** – This indicator identifies all tasks and milestones that have been improperly progressed with a date that is later than the assigned project status date. The impact of this type of error is that schedule dates and calculated slack values associated with tasks/milestones in the downstream logic will also be incorrect.

- ***"Tasks marked as Milestones (Note: having a duration of >0)"*** – This indicator identifies all schedule tasks that have a duration assignment that is greater than zero, but also has been marked within Microsoft Project to be shown as a milestone. Microsoft Project will use the duration to calculate the path through this activity but it will show as a finish milestone. While this technique does not impact schedule slack calculations, it does prevent the schedule user from seeing the true task progress and seeing why there is a gap between the predecessor task and the milestone. The impact to the user is that a schedule task may be significantly behind schedule, but the user potentially won't be aware of the situation because it will be hidden and only reflected as a finish milestone.

- "***Tasks With Estimated Duration***" – This indicator finds all tasks that have been added to the IMS without a specified duration assignment, or a duration assignment that is flagged as estimated and needs verifying. This type of occurrence is usually caused by the scheduler forgetting to add a duration value or not knowing what the correct duration assignment should be. Remember that incorrect task durations lead to incorrect schedule dates and also incorrect schedule slack calculations.

- "***Manual Tasks***" - Microsoft Project introduced this feature in the 2010 release to allow activities to be maintained and controlled manually by the user. The manual schedule mode provides a means for inputting duration and date values in free form or in general terms for situations where schedule information may be limited and/or confidence is low. In manual schedule mode task relationships are not considered, and therefore have no bearing on calculated task start/finish dates. Manual scheduling is a method best served by occasional schedulers and results in a format much like an excel listing of tasks to be worked. This feature may have a purpose and a time for use, but for typical project scheduling that requires

Critical Path Method (CPM) functionality, the manual schedule mode should not be used. The impact of having manually scheduled tasks mixed within a normal CPM functioning project schedule is that critical path identification may be hindered or even prevented due to manual task relationships not being considered in calculating accurate total slack values.

Part Four provides a breakdown of the type and quantity of constraints that are assigned within the schedule. A constraint is a fixed date that has been assigned to a task or milestone in order to control when it starts or finishes. Caution should be exercised when using constraints because they are a significant factor in how slack (float) is calculated throughout the project schedule. All constraint types have some bearing on slack values, but certain types, such as: As Late As Possible, Finish No Later Than, Must Start On, Must Finish On, and Deadlines act as completion points in the IMS from which the total slack values are calculated. While it is true that sometimes certain schedule situations arise that necessitate the valid use of a constraint, many times constraints are over used and severely hinder the scheduler's ability to identify the project's critical path. Ideally, minimal use of constraints, other than "As Soon As Possible", is strongly encouraged. This Health Check indicator identifies and counts all constraints except for those with "As Soon As Possible", so that they can be evaluated for the extent of their impact to the project schedule. *Note: Deadline assignments are also included in the constraint count due to their impact and results being the same as a Finish No Later Than constraint.* Each of the constraint types have a listing of the activities counted in a separate tab of the excel workbook.

Part Five provides a breakdown of the logic relationships and the lags used within the remaining tasks of the schedule. The majority of the logic relationships should be finish to start (FS) relationships with no lag. Any negative lag relationship will be flagged as red and should be questioned, the justification for using the negative lag relationship needs to be supplied. Also the FS positive lags should be reviewed to see if there is work in the lag time that needs to be represented with a task. A separate tab of the excel workbook has a listing of the tasks with negative lag and FS relationships with positive lag.

After running the STAT Health Check, the user can find the detailed listings of tasks and milestones that are identified and counted for each indicator metric contained in Parts Three, Four and Five that are explained above. As shown in the figure below (Figure 3-10), the worksheet tabs located at the bottom of the Health Check screen can be selected to provide the specific indicator details for printing, reviewing, and as-needed corrections. *Note: the underlined indicator titles may also be clicked to provide the link to detailed listing of tasks and milestones that make up that particular metric count.*

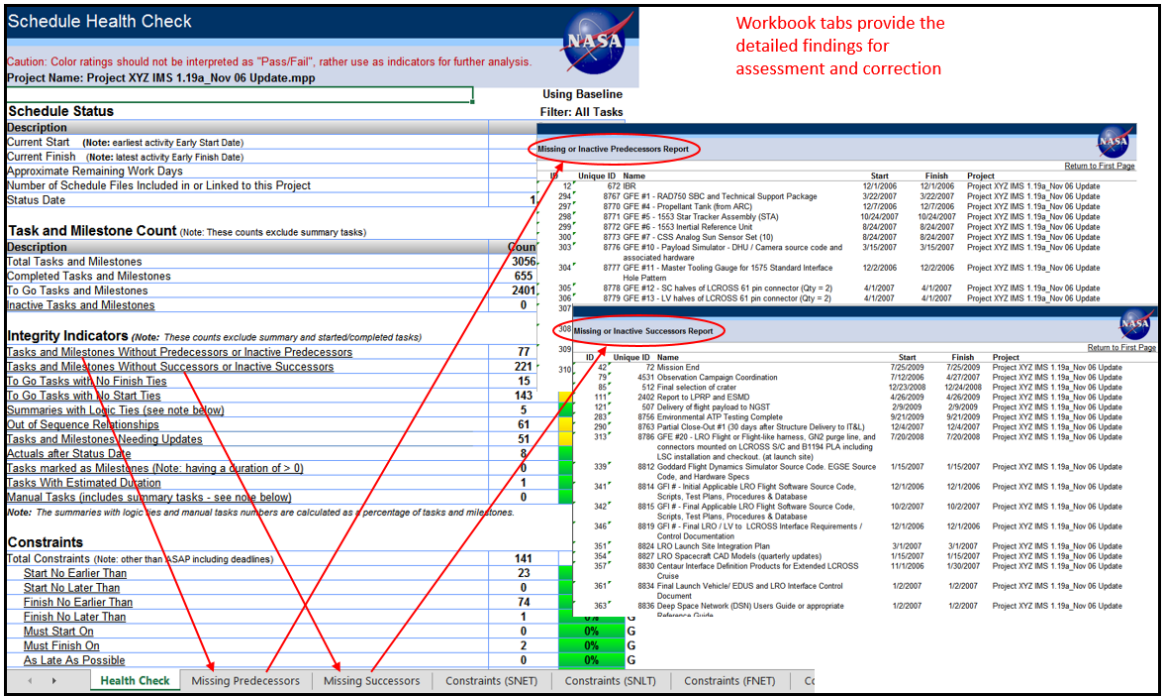


Figure 3-10: Health Check Detailed Indicator Listings

Part Six provides a table showing how the project IMS can be broken down into three categories of total slack (float) values for analysis and general information purposes. The minimum and maximum total slack are shown for information. The categories of slack are described below:

1) The first category indicates the number and percentage of remaining detailed schedule tasks contained in the IMS that have ten days or less of total slack. A general rule of thumb pertaining to this category indicates that less than 30% of the schedule should fall into this category. If 30% or greater of the scheduled tasks within an IMS have ten days or less of slack then it is highly probable that the project schedule is too optimistic and most likely unachievable. Schedule review and re-planning by the project team is recommended.

2) A second category indicates the total percentage of detailed schedule tasks within the IMS that have total slack values that are greater than 25% of the remaining project duration. In other words, this is a measure of how much of the project schedule has excessively high slack values. The analysis insight that comes from this category for situations where the resulting percentage is 30% or greater is that the schedule has not been sequenced properly. Interdependency relationships between tasks either have not been assigned at all or they have been assigned incorrectly. Encountering this situation should also result in a review of the IMS by the project management team.

3) The third category total slack values in this metric indicates the total percentage that makes up the balance of IMS tasks that are not falling into either of the above categories. The analysis insight that can be gained from this category is that the resulting percentage of tasks that do not have too little or too much total slack should generally always be higher than either of the two categories described above. Any time this category is lower than either of the first

two categories it becomes another indicator of poor or missing task interdependency relationships, or an overly optimistic schedule.

Part Seven provides a table which displays a profile of all remaining task/milestone durations. The importance of this information is to gain an understanding of the level of task detail contained in the IMS and make an assessment as to whether it is adequate or not. Generally, when task durations are long it is much more difficult to identify the specific interface points needed to allow for meaningful finish-to-start task relationships. The level of task detail within the IMS typically correlates to the development phase that the project is currently in. NASA projects in pre-phase A and also during portions of phase A generally reflect less detail in task definition resulting in much longer durations. As a project proceeds into phase B and later phases, the project definition becomes much clearer and task durations should become shorter and more discrete allowing effective task interdependencies and meaningful progress/performance measurement. It is important to understand that the more meaningful and discrete the level of task detail is, the more effective and accurate the IMS will be for determining critical schedule drivers, measuring project progress/performance, allocating resources, and forecasting future accomplishment. In simple terms it is recommended that the predominant number of tasks within an IMS should not exceed three months in duration preferably less than two months. It is understood that keeping with these goals is not always possible and that tasks should not be arbitrarily split when there are not logical and meaningful break points. In situations where rolling wave planning is occurring there may be longer duration tasks in the future that will be broken down at a later date, but these planning packages need to be detailed enough to determine the true critical path to the end of the project.

Part Eight provides total slack (float) information for the five lowest slack paths and number of tasks in each path, contained in the project IMS. The lowest slack path is considered the primary critical path followed by the next four secondary paths. All five paths should be monitored closely on a continuing basis to ensure schedule validity. The management team should be aware of the specific tasks and milestones on each path and ensure that each assigned task duration and interdependency accurately reflects the planned implementation model. Caution should be used before making any analysis assumptions using the top five critical path data. It is very important to validate the credibility of each of the five paths contained in this metric. If the schedule Health Check indicates poor ratings for IMS formulation and integrity then this metric will be of lesser analysis value. The listing of the tasks that make up the five paths are shown in the Critical Paths tab. Clicking on any of the underlined path numbers will take you to this tab.

The analysis information gleaned from this graphic is typically found in the slack values of each path and also the number of tasks contained in each path. Below are examples of analytical data that can be gained from this table along with the potential analysis conclusions that can be reached.

1) If, after validating the credibility of the five lowest paths, the primary critical path, as well as any of the secondary paths, have negative or significantly low total slack (float) values, then the project schedule may not reflect a feasible or realistic plan for success.

2) Many times the number of tasks making up the critical path is a good indicator of credibility. Assuming that the level of task detail across all WBS elements contained in the IMS should be consistent, then it is generally expected that the primary critical path will contain more tasks than the secondary paths. This is expected because, by definition, the primary critical path

represents the longest duration path from the current status date through the IMS network to project completion. If this is not the case, then it potentially indicates either inconsistency in task detail or an invalid use of fixed task constraints.

CAUTION: The Critical Path/Total Slack analysis reflected in the Critical Path Analysis Table are based solely on the project's IMS logic network (ie; predecessors, successors, durations, constraints, etc.). It should be noted that the credibility and value of this data should correlate directly to the quality reflected in the Schedule Formulation and Integrity Assessment shown above in this report.

Part Nine provides miscellaneous additional indicators that can assist the user in determining the integrity and credibility of the IMS. Some of these indicators are derived automatically as a function of the Health Check assessment and other indicators are included as manual entries determined from observations and user judgment. The following detailed explanations are provided for Part Five indicators:

- ***"Recurring Tasks"*** - This indicator identifies tasks and milestones that are normally repetitious in nature, and that typically should not impact the project critical path. Examples of this type of task include: weekly meetings, routine report issuances, routine reviews, etc. While these tasks are necessary when resource loading is required, it can be a real concern if the IMS is predominantly made up with these kinds of tasks instead of the real project work scope. A listing of these tasks are provided in the Recurring Tasks tab.

- ***"Schedule Traceable to WBS (Y/N)"*** – This Health Check indicator is a manual entry by the Health Check user because Microsoft Project auto-fills the WBS field with system generated values that are typically not the correct project WBS element identifiers. Prior to making this entry the user should take a quick look at the schedule to determine how much of the IMS has the correct WBS elements identified. Keep in mind that a project WBS serves as the approved framework for all technical, financial, and schedule planning. It is also a NASA requirement for the project WBS to be consistent with the integrated project baseline for all technical, budgetary, and schedule content. Having the WBS fully integrated into the IMS is a key approach to ensuring the required consistency exists.

- ***"Realistic Critical Path(s) (Y/N)"*** – This indicator is a manual entry by the Health Check user. It is strictly a subjective judgment call, but should be, in a large measure, based on the results indicated in the Part 3 and 4 stoplight assessment portion of the Health Check. If the stoplight indicators are predominantly red for IMS logic then it is reasonable to assume that any critical path identification or information would be very suspect at best, and typically not trustworthy for management decision making. Also the top critical paths should be reviewed by the project team to determine if they are valid paths.

- ***"Schedule Baselined Tasks"*** – This indicator quantifies, for the Health Check user, how much of the to-go IMS has been baselined. It should be understood that project management "best practices" dictate that at some point the total remaining project schedule should be baselined in order to provide for meaningful performance measurement.

- ***"Tasks With Resources"*** – This indicator quantifies the number of tasks that have resources assigned. Since it is clearly true that project schedules cannot be successfully met unless adequate resources are available, it becomes important to the analyst to know if resources have been reasonably considered when developing the project IMS. This indicator provides additional insight into schedule credibility.

- ***"Total Tasks (Including summary tasks)"*** – This final item provides the total number of tasks including the summary tasks. This item is intended for information only.

Section 4: The Schedule Assessment Summary Report (SASR)

Initiating the Schedule Assessment Summary Report (SASR)

The purpose of SASR is to provide the user with a tool for obtaining quick assessment data reflecting both schedule integrity and schedule performance. This tool incorporates a combination of the primary credibility indicators from the Health Check along with other metrics that help assess sound planning and performance achieved. The SASR output report provides multiple types of graphical formats to assist the user in making correct assessment judgments and arriving at accurate performance analysis.

To initiate this analysis function, select the SASR icon from the MS Project toolbar. *Note: If using Microsoft Project 2010 or 2013, the SASR icon will be listed under the "Add-Ins" tab on the toolbar.* This icon initiates the automated SASR wizard to lead the user through five simple steps to produce a Schedule Assessment Summary output report.

Step 1 produces a wizard dialogue box (see Figure 4-1) that allows the user to set the schedule "Status Date" on which the resulting assessment and analyses data will be based. Generally the status date will already be set within the project schedule file, but if not, STAT will alert the user to set the correct date within this wizard. This dialogue box also allows the user to select the correct baseline version to be used in calculating the various assessment metrics addressed within the SASR module. If no specific baseline is selected, the default version will be set on "Baseline".

After selecting the desired Status Date and correct baseline version, then click "Next".

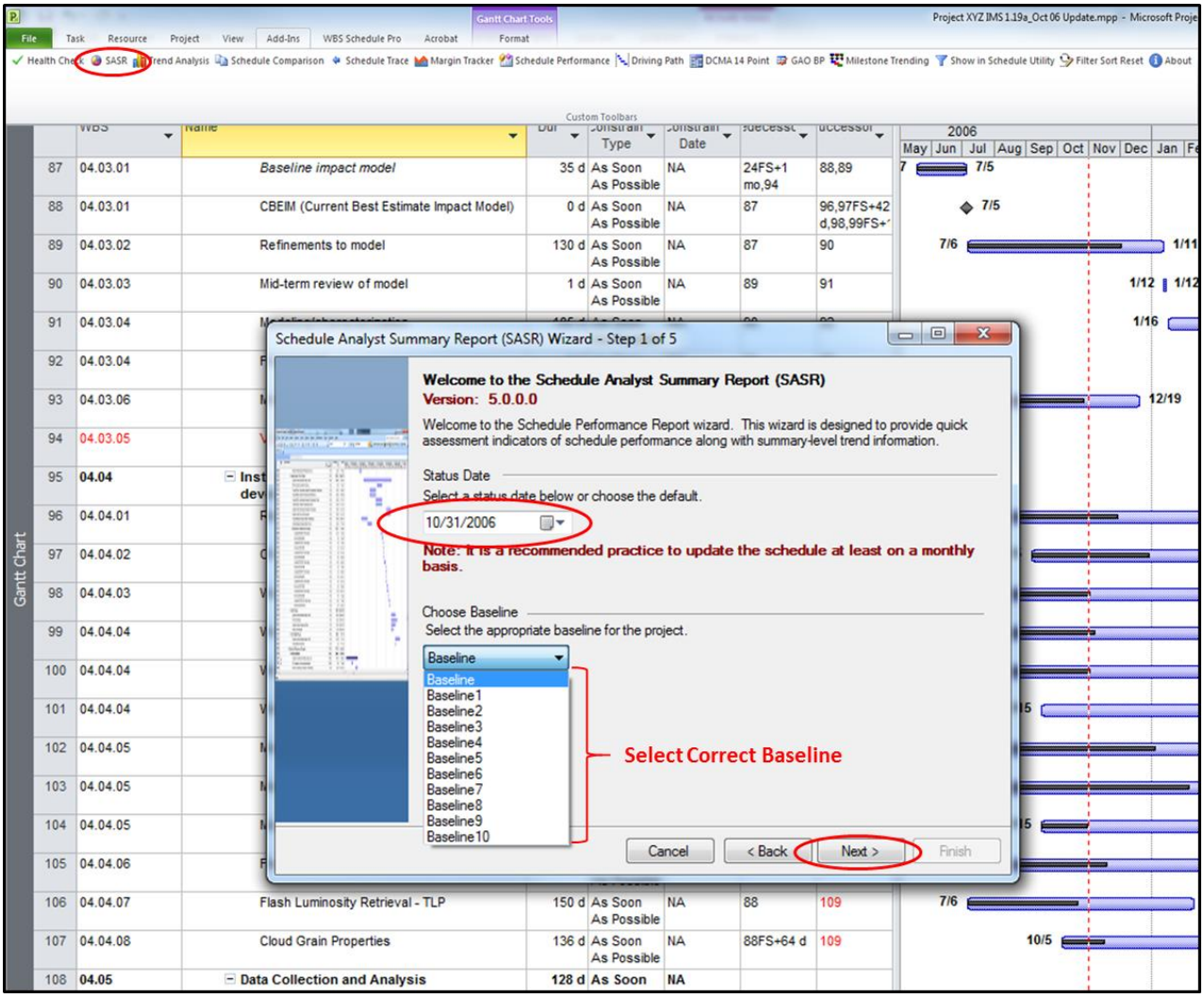


Figure 4-1: Schedule Assessment Summary Report Wizard – Step 1

Step 2 produces a wizard dialogue box (see Figure 4-2) that allows the user to indicate whether or not to calculate the monthly "Hit or Miss" value. This calculation reflects a performance index of how many tasks and milestones that were baselined to complete during the current month actually were completed. If the "Hit or Miss" option is selected then the value will be plotted along with the Baseline Execution Index (BEI) on the SASR output report. If it is not selected then the output report will only show the BEI metric.

The filter selection allows the user to keep filters that are already set in the IMS or use no filters when running the SASR module. "Use No Filters" is the default setting and will remove all filters that may be set before analyzing the complete schedule. *Note, if "Use Current Filters" is selected, then the user defined filter that is already set along with any auto filters will remain in effect, and only the selected portion of the schedule will be analyzed.*

After completing the desired step 2 choices, click "Next".

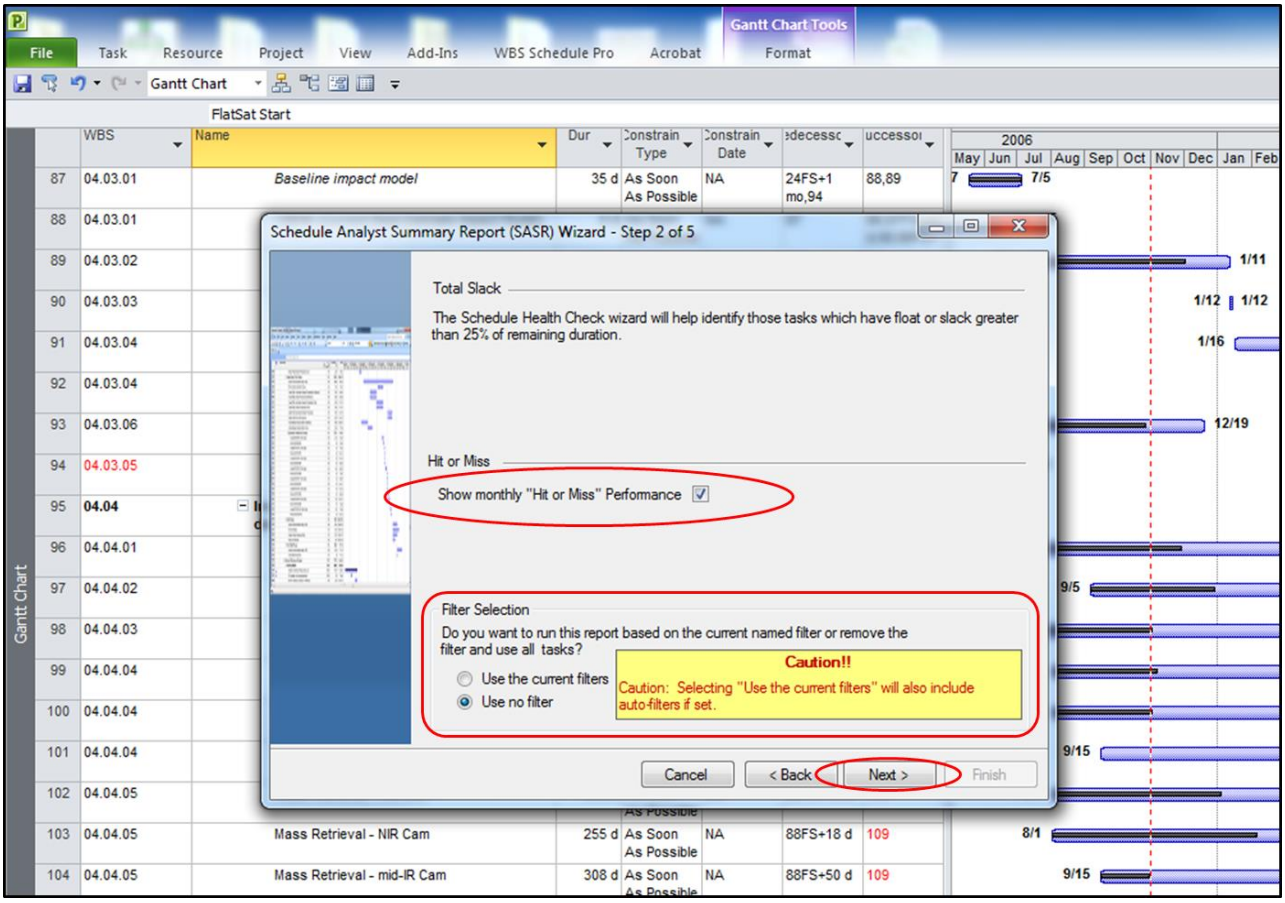


Figure 4-2: Schedule Assessment Summary Report Wizard – Step 2

Step 3 produces a wizard dialogue box (see Figure 4-3) that allows the user to include the Current Execution Index (CEI) metric as part of the SASR output report. If the user chooses to include the CEI then they will be required to browse and select a previous version of the same schedule to enable STAT to gather the forecasted task start/finish dates that were projected for the period just completed. This information is needed to complete the CEI calculation. SASR also provides the user with the option to reflect the new CEI result as part of a continuing graphic which displays previous period results. If this is desired then the wizard allows the user to browse and select a previous report where the new result will be added. After CEI setup choices are complete the user will then select "Next".

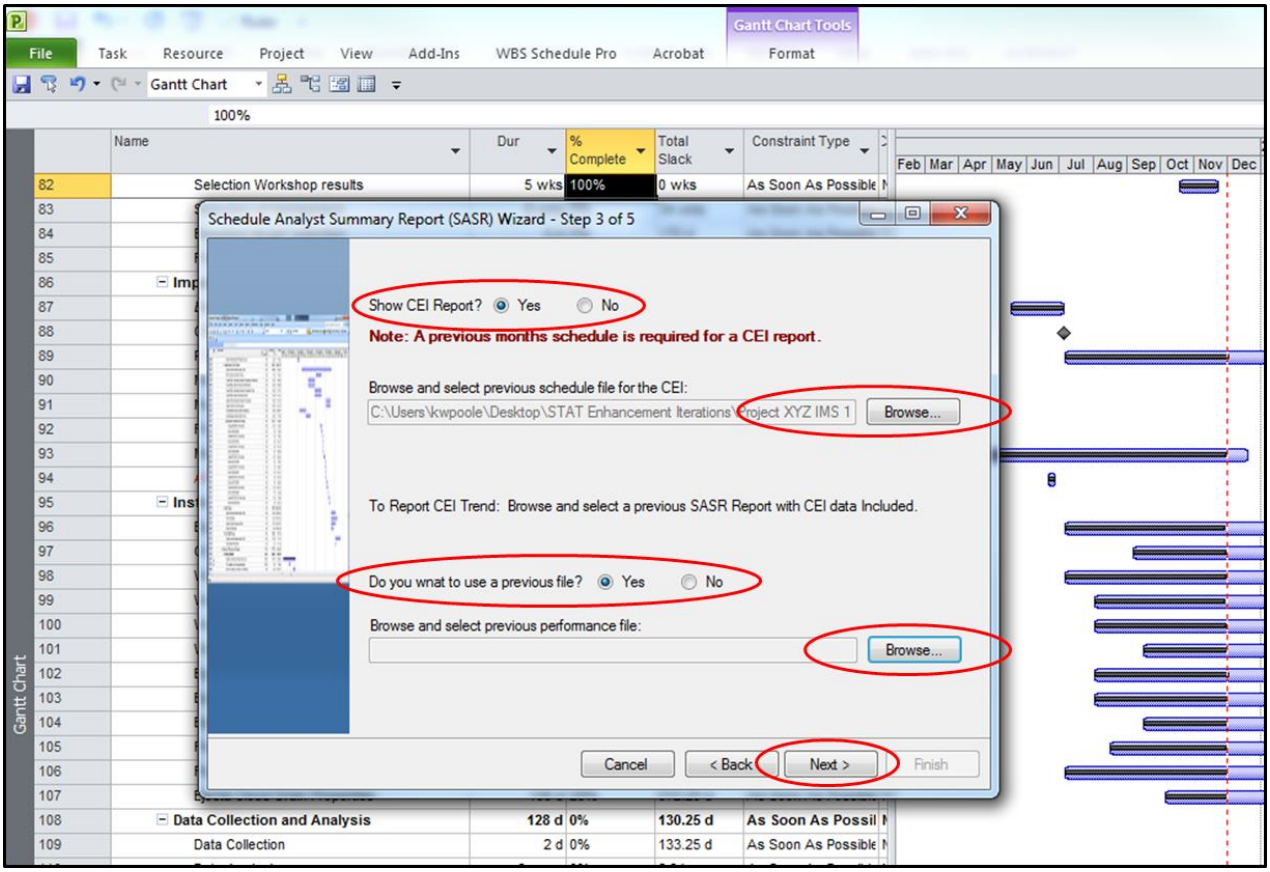


Figure 4-3: Schedule Assessment Summary Report Wizard – Step 3

Step 4 produces a wizard dialogue box that allows the user to select key milestones to monitor variances from the approved baseline dates. The SASR output report provides a comparison graphic that highlights the amount of variance from baseline dates for only those milestones that are selected in this dialogue box. This dialogue box provides two options for identifying the desired milestones to be assessed in the output report. Option one (see Figure 4-4) is to select "All Milestones" from the drop down listing. This choice provides a listing of every milestone contained in the full schedule (or only the filtered portion) from which the user can scroll through and individually pick the milestones to be assessed. *Note, when Option One is used, the user must remember to hold down the Control key while making the individual milestone selections.* Option Two (see Figure 4-5) is to select a pre-defined filter previously established which will automatically select the desired set of milestones from the IMS to be assessed and reflected in the output report. There is no limit on the number of milestones that may be selected for any single SASR run.

The Step 4 dialogue box also provides a browse function to allow the user to select the location where he wishes the final SASR output file to be exported/stored.

After completing the desired step 4 choices, click "Next".

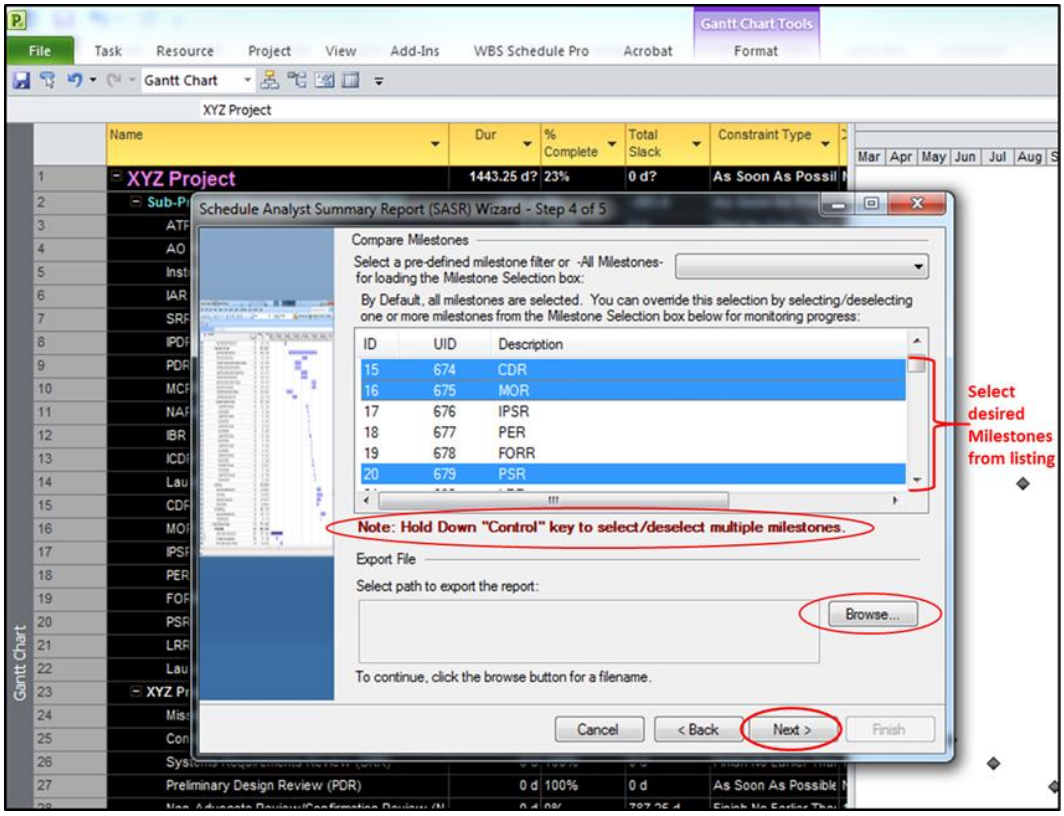


Figure 4-4: Schedule Assessment Summary Report Wizard – Step 4, Option 1

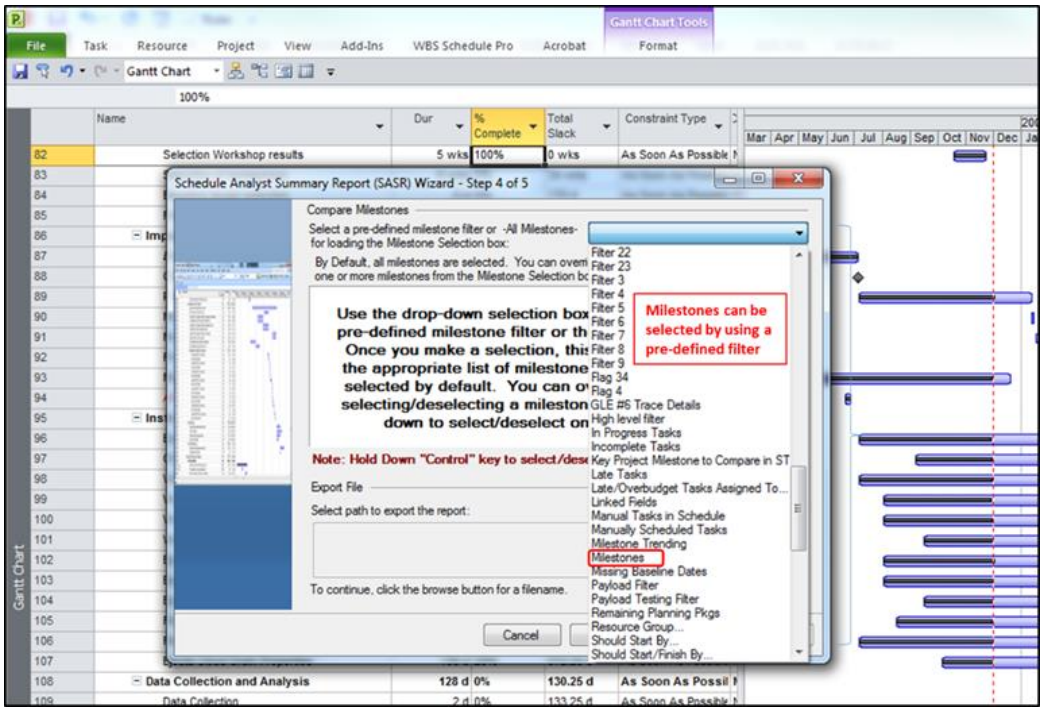


Figure 4-5: Schedule Assessment Summary Report Wizard – Step 4, Option 2

Step 5 of the Wizard produces a final dialogue box (see Figure 4-6) that allows the user to complete the final step in initiating the SASR analysis report. This dialogue box informs the user that Microsoft Excel 2000 or later must be installed. The user is also informed that the processing time for creating and transferring the SASR data results into the Excel template may take several minutes if the schedule file size is very large. A processing status is also provided to keep the user informed on the status of the tool during its gathering and formatting of data from the schedule into the final output report.

Click Finish to complete the Schedule Assessment Summary Report processing and compilation of assessment and performance data.

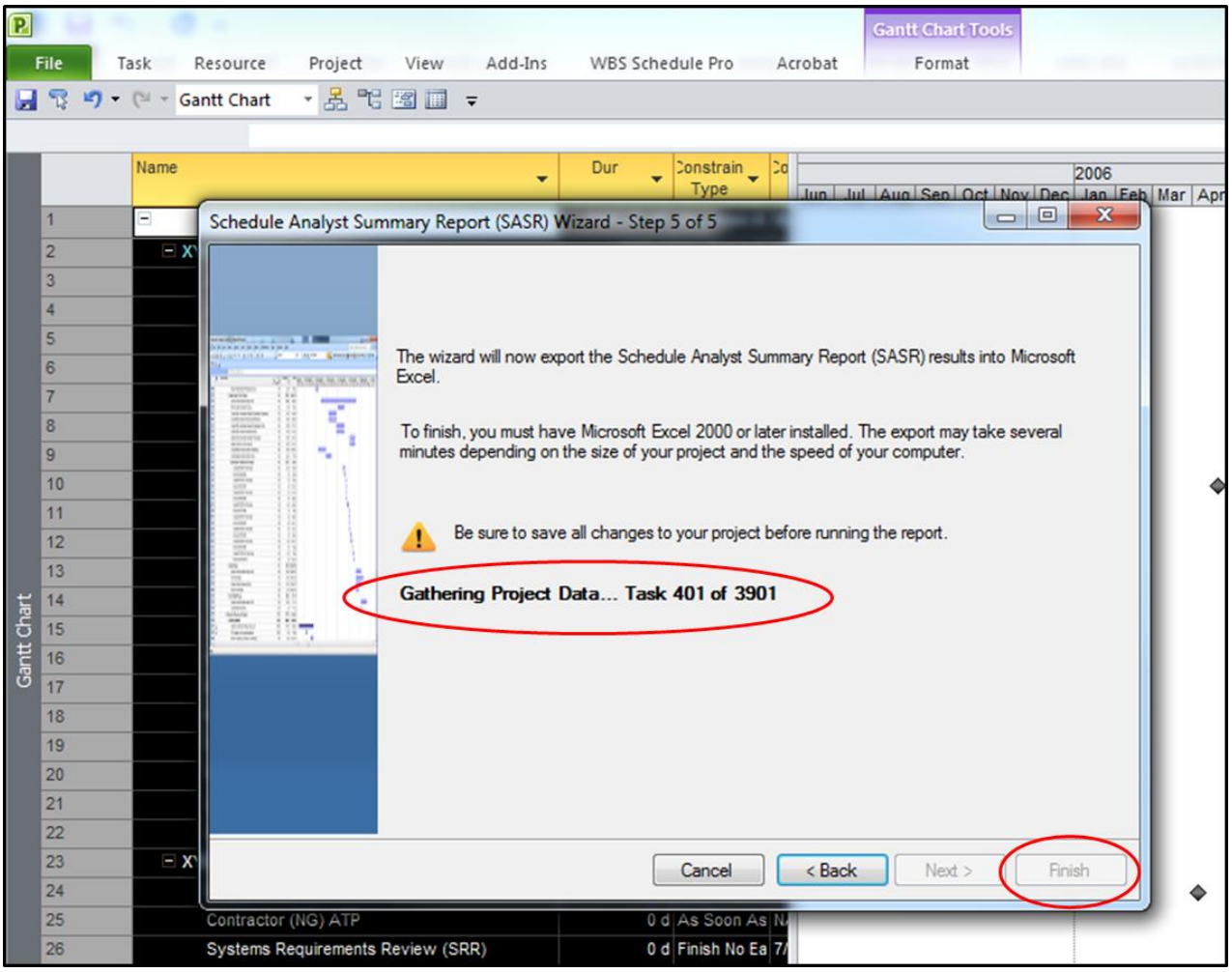


Figure 4-6: Schedule Assessment Summary Report Wizard – Step 5

Understanding Schedule Assessment Summary Report Results:

The SASR output is formatted as a multi-page Excel report containing ten different analysis metrics along with an available input space for the planner/scheduler or analyst to input relevant notes or analysis comments derived from the output metrics. As noted earlier, the SASR includes the primary credibility indicators from the Schedule Health Check along with various other integrity and performance data. Nearly all of the SASR metrics are reflected in user-friendly stoplight fashion. The stoplight ratings contained in this report are based on calculations per the designated criteria and threshold factors designed for each analysis metric. The following paragraphs provide explanations and insights for each part of the SASR report that may be helpful to the user in arriving at the most accurate analysis of the schedule. *Note: Each of the graphics can be copied and pasted to PowerPoint or other applications but for best results past the graphic as a picture.*

Schedule Analyst Summary Comments: This space (see Figure 4-7) is provided for the user to document and explain his/her summary findings and/or list the relevant questions/concerns that arise after assessing and analyzing the SASR output data. This portion of the report also identifies which baseline version has been selected and used in the performance analysis metrics.

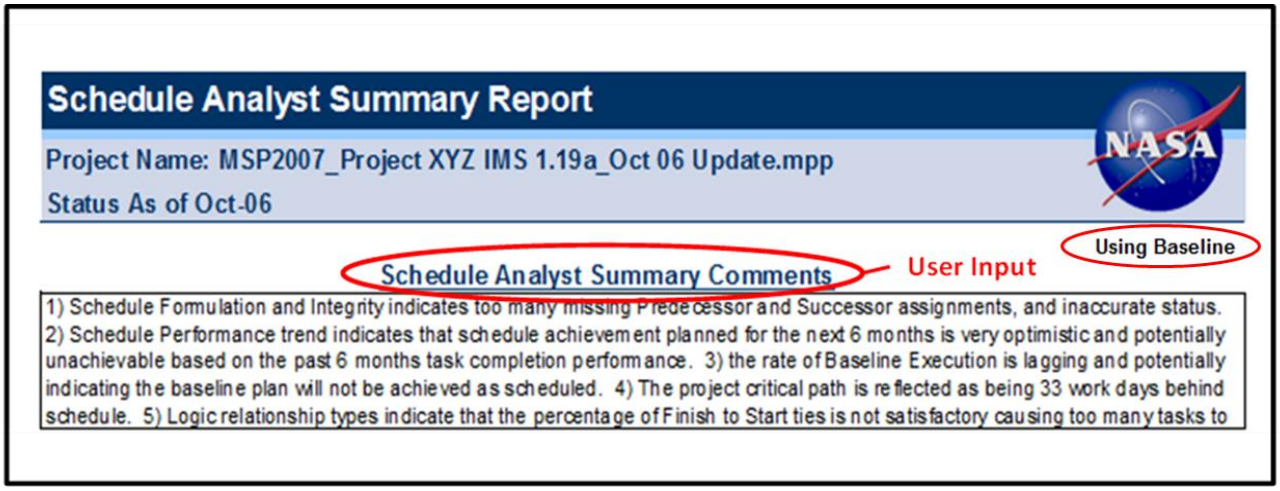


Figure 4-7: Schedule Assessment Summary Report (SASR) – Analyst Comments

Schedule Formulation and Integrity: This graphic provides key selected Schedule Health Check credibility indicator results in a histogram format (see Figure 4-8). Primary credibility indicators include: how many tasks/milestones have missing predecessors, how many tasks/milestones have missing successors, how many tasks/milestones have fixed (imposed) date constraints assigned, and how many tasks/ milestones that need correct status (progress) updates. As indicated earlier in the Schedule Health Check section of this guide, Critical Path Method (CPM) scheduling guidelines call for logic networks to be structured so that all detailed tasks and milestones have accurate predecessor and successor relationships assigned *(Note: this excludes minimal valid exceptions such as, Project Start, Project Complete, external project deliveries, etc.)*. Additionally, it is crucial for only valid task date constraints *(ie; facility availability, component deliveries from external sources, etc.)* to be

used in a logic network, as well as an accurate reflection of current status (including new forecast dates for behind-schedule tasks) for all "to-go" tasks and milestones in the IMS. It is important that no task or milestone be left without progress prior to the current status date in the IMS. The higher the number of instances where these guidelines are not followed within a project schedule, the more improbable it is for accurate task dates to be calculated and also for a clear identification of the true critical path for the project.

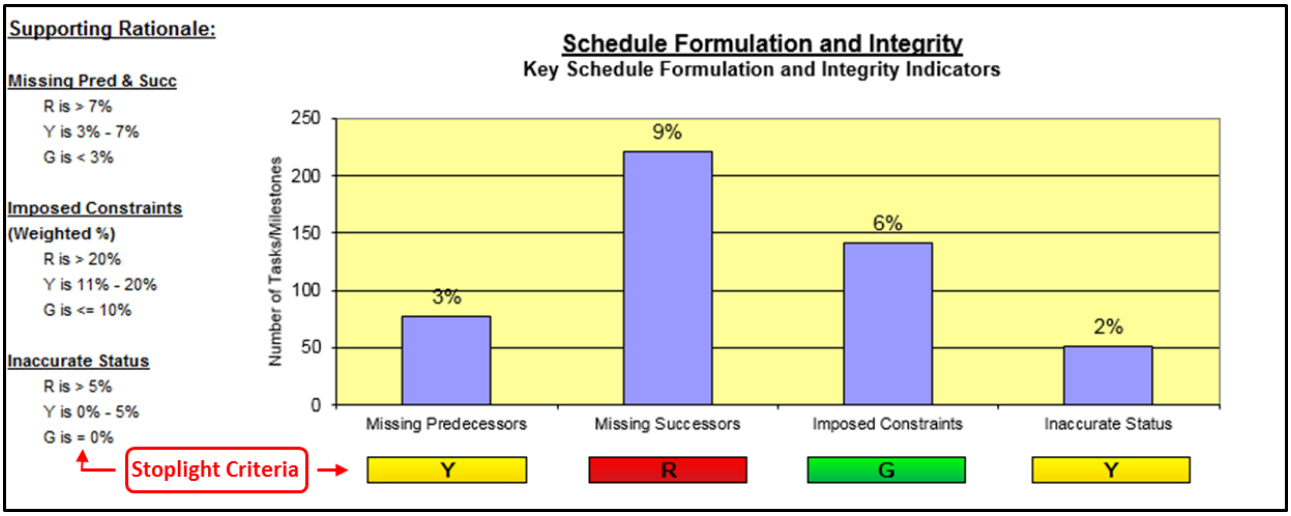


Figure 4-8: SASR -Schedule Formulation and Integrity

Logic Relationship Types: This graphic provides a breakdown of the types of task relationships and reflects the percentage of use within the IMS for each of the relationship type. As noted in the figure below (Figure 4-9), the percentages shown in this metric are based on the ***to-go*** number of detail task and milestone relationships remaining in the IMS. CPM scheduling techniques utilize four different logic relationship types when establishing the sequence of tasks in the network. The four relationship types include: finish-to-start, start-to-start, finish-to-finish, and start-to-finish. It is important to note here, that it is an industry recognized goal to break down task detail to a level where finish-to-start relationships are used at least 90% of the time. It is also a NASA recommended goal that start-to-start and finish-to-finish relationships not be used any more than 5% of the time. True start-to-finish relationships between tasks are rare occurrences in sequencing work tasks, therefore it is not recommended that this relationship type be used in more than 1% of the assigned task dependencies within an IMS.

Each type of task relationship serves a specific purpose in reflecting how the project work will be sequenced. Using appropriate relationship types allows the planner/scheduler to create an accurate model of how the work is expected to be accomplished. This model can then be used for effective management of work and resources. The model can also be used for determining the project critical path (longest contiguous path to completion), along with identifying other secondary schedule drivers. If the schedule model lacks credibility then most data will be suspect and ineffective for management use.

As the scheduler assesses the IMS for credibility, the percentage criteria noted above enables the scheduler to make a determination as to the validity with which the schedule logic has been

constructed. If the relationship percentages indicate that the logic network is not appropriately constructed using recommended relationship types, then schedule credibility will be lacking and data will potentially be inaccurate for management use

This graphic also provides other metrics that can be used for schedule assessment purposes. One such metric relates to the number of task relationships that include negative lag values (lead values). Task/milestone relationships containing negative lag values means that a successor task can actually occur prior to the predecessor task. In reality, this type of work sequence happens very rarely in a project and usually will only apply to a very specific or special situation. Therefore, as the illustration below shows, the number of relationships that include negative lags should be very small (the stoplight rating indicates a goal is no negative lags). Another important metric STAT provides is the quantity/percentage of Finish to Start (FS) relationships that also include the use of positive lag values. The use of a FS relationship between tasks, along with a positive lag value results in a gap between the involved tasks that typically cannot be explained with any valid rationale. Past experiences and assessments have typically indicated that the gaps created by this type of relationship in a schedule should really have been represented by the inclusion of an additional duration-based task that can be monitored and progressed to more accurately model and manage sequence and time phasing of scheduled work. The stoplight rating for this situation is set to reflect Red if there are greater than 10% of the to-go FS relationships that have positive lags. A Yellow stoplight will occur if the percentage is between 6% and 10%. A Green stoplight will be indicated if the percentage is less or equal to 5%. Quantities for other non-stoplight task relationship uses are also provided to help assist the user in his overall schedule analysis. It should be noted that accurate total slack calculations and critical path identification can only be accomplished when proper logic relationships are applied.

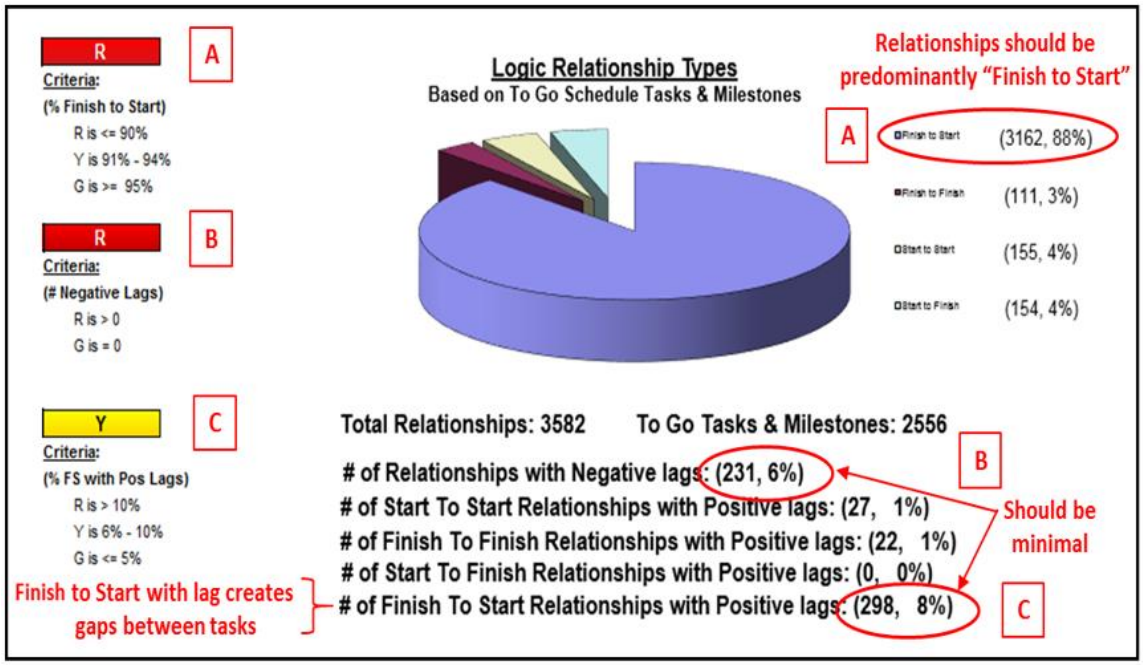


Figure 4-9: SASR – Logic Relationship Types

Schedule Performance Trend: This graphic provides analysis insight based on performance trends relating to actual and projected task and milestone finishes. This metric focuses on the six month period prior to the current status date and also looks ahead to the six month period following the current status date. STAT provides monthly insight into the comparison of baseline, forecasted, and actual task/milestone finishes that occur or are planned to occur. A monthly average of forecasted task finishes is also calculated to reflect how many task finishes must occur to stay on schedule. The average monthly performance of the past six months is also calculated and can be compared to the average projected for the next six month period to see if the required monthly completion rate is optimistic, pessimistic, or reasonable.

Figure 4-10 below, provides an example of how the Schedule Performance Trend metric can be used for analysis and what other information can be gleaned and understood. The following illustration reflects a trend situation where the average monthly task completion rate during the past six months was 77 tasks/milestones per month. Based on this past performance trend, is it reasonable to expect the project to complete 202 tasks/milestones per month for the next six month period, as the figure indicates must be done to stay on schedule? The initial answer would typically be "*no"*. However, at this point the planner/scheduler should look within the IMS to identify those specific tasks that are scheduled to complete during the next six months and determine if the type of work is such that tasks can be completed at a rate nearly triple what has previously been accomplished.

Other helpful information displayed on the Schedule Performance Trend are tasks and milestones that have been scheduled to be worked, but are not progressed as time passes. The result of this practice is that incomplete schedule tasks are continuing to be reflected to the left of time-now, or in past history. It should be noted that this practice is not satisfactory for sound schedule management. In order to maintain schedule accuracy and critical path credibility, it is crucial that all tasks/milestones that were previously scheduled to have been started or completed prior to time-now, be assigned with new forecast start/completion dates in the future if previous scheduled dates were not achieved. Tasks with inaccurate status, as described above, will impact accurate total slack calculations on involved tasks and also hinder meaningful and effective schedule analysis.

The Schedule Performance Trend stoplight rating is based upon the specified criteria range as reflected in the output report. The stoplight is Red when the average required completion rate for the next six months is more than 20% higher than the past six months monthly average, and Yellow when the required average is from 11% to 20% higher, and Green when the future required average completion is less or equal to 10% higher than the past six months.

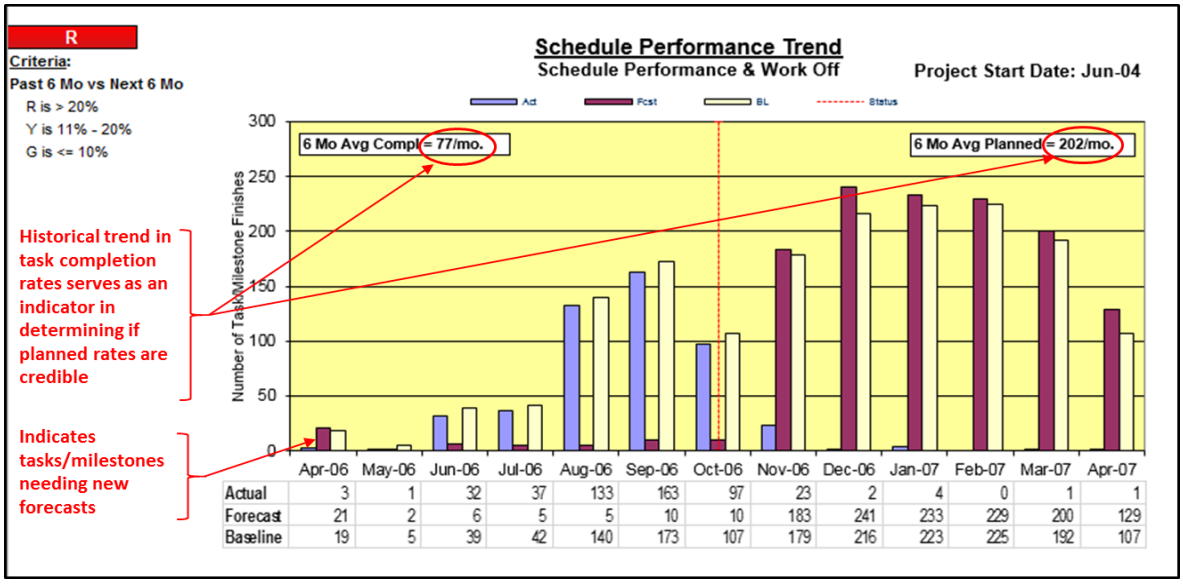


Figure 4-10: SASR – Schedule Performance Trend

Baseline vs. Actual Finishes Analysis: This analysis graphic reflects actual schedule performance against the baseline plan. As shown below in Figure 4-11, this metric reflects the basic monthly cumulative total of tasks/milestones that have actually been completed to-date versus the cumulative total of schedule items that should be completed to-date per the baseline plan. This metric is not concerned about whether tasks are completed during the correct baseline month or not, but rather a basic comparison of the total cum actuals to-date versus the total cum baseline plan to-date.

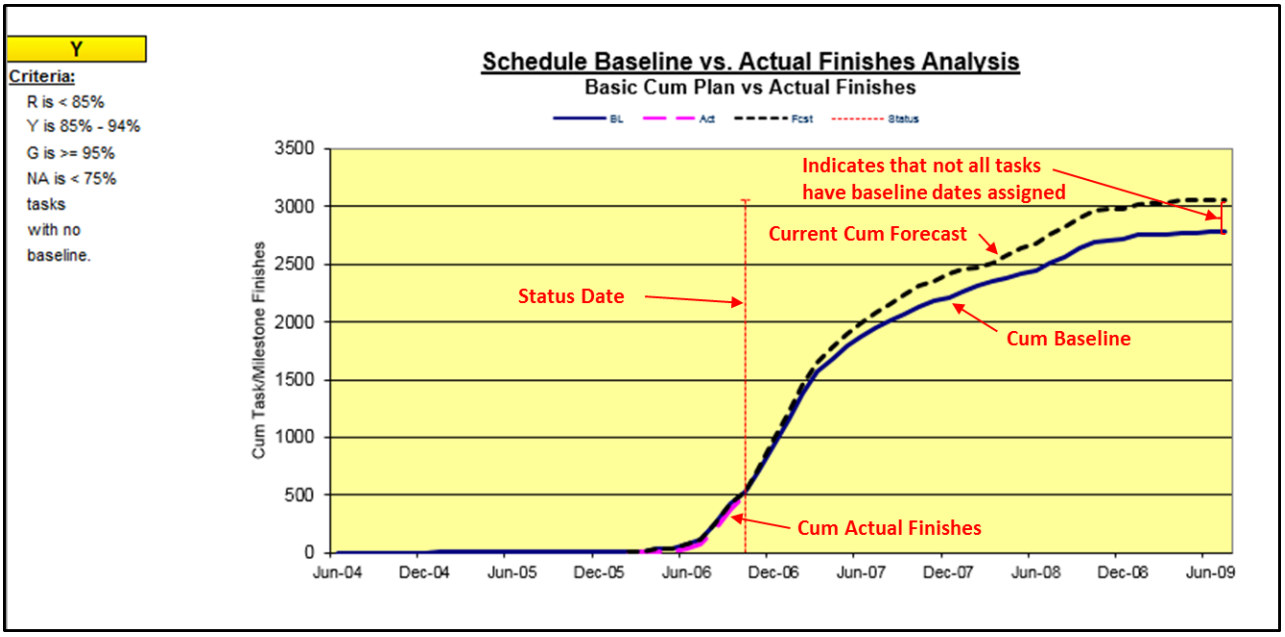


Figure 4-11: SASR – Schedule Baseline vs Actual Finishes Analysis

While this metric may not indicate whether the baseline plan is being completed per the correct time phasing, it does reflect whether or not general progress is being made against the baseline plan. Additional assessment of the specific completion data is required to determine if the right baseline tasks are being worked during the correct months. The next metric will provide the additional assessment data required for determining if the right tasks are being worked and completed.

The Baseline vs. Actual Finishes graphic also reflects whether or not the baseline is being maintained properly. As shown in Figure 4-11, if a gap exists between the cumulative forecast curve and the cumulative baseline curve, then this is an indication that new tasks are being added to the schedule, but not being incorporated into the baseline plan. The baseline plan must be maintained by assigning baseline dates to new tasks as the necessary management approvals are received.

Baseline Execution Index (BEI): This metric (see Figure 4-12) provides two different performance perspectives on how well a project is performing in completing the baseline plan. The primary metric provided in this graphic calculates a BEI value which indicates to the user how well the project is following the baseline plan and completing baseline tasks as they are scheduled to be completed . The BEI is calculated using the following formula:

BEI = cum # of baseline tasks completed / cum # of baseline tasks scheduled for completion.

The stoplight will indicate a Green rating if the BEI value is .95 or greater, and Yellow if the BEI value is between .85 and .94, and Red if the index is less than.85. As the BEI value gets lower, the less likely that the project will be completed on time per the baseline plan. If the BEI value is greater than "1", this is an indicator that the project is doing well and performing ahead of the baseline plan.

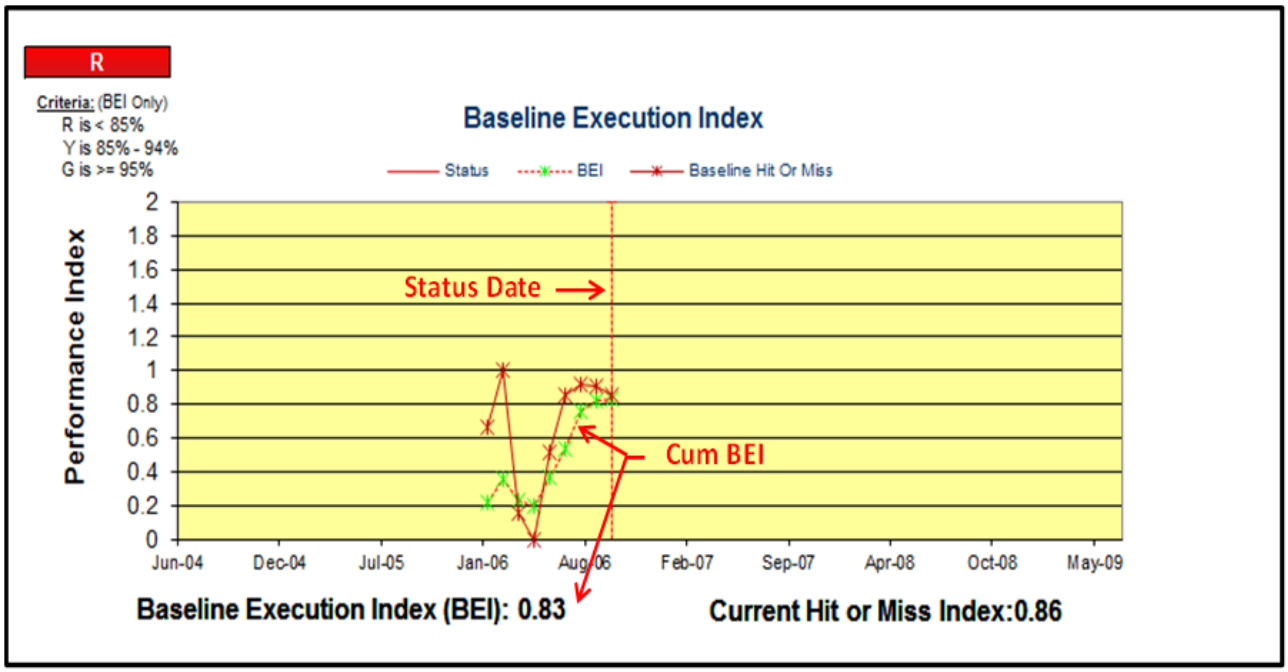


Figure 4-12: SASR – Baseline Execution Index (BEI)

A secondary performance metric option is also available within this graphic, if selected by the user. This optional metric is similar to the BEI, but instead is a completion index value for *only* a specified month's task completion performance. It applies to those specific tasks/milestones whose baseline schedule calls for them to be completed during the specified month. This measurement is referred to as the "Hit or Miss" (HOM) metric because it focuses solely on the specific tasks/milestones that are baselined to occur in the month and reflects that they are either accomplished or not. The HOM index is calculated using the following formula:

Hit or Miss (HOM) Index = total baseline tasks completed during the specified month / total of baseline tasks scheduled for completion during the specified month.

Performance analysis using the HOM index (see Figure 4-13) indicates that during the specified month the baseline tasks/milestones are either finished during the month or they were not. If all tasks/milestones are completed during a specified month that are scheduled to finish per the baseline plan then the HOM will equal "1" on the scale. On the other hand, if only six out of ten baseline schedule items are finished during the correct month, then the HOM will equal "0.6".

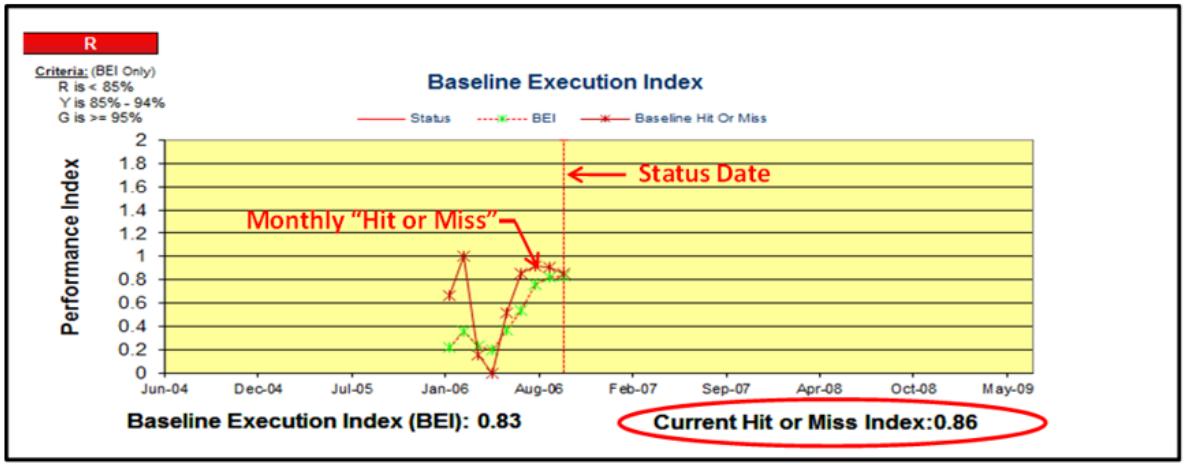


Figure 4-13: SASR – Baseline "Hit or Miss" Index (HOM)

Analysis questions that can be easily answered by the data contained in this graphic include the following:

a) Is the baseline plan being worked?
b) Is the rate of baseline accomplishment sufficient to achieve project success?

To illustrate the analysis insight that can be gained from the performance data reflected in Figures 4-11, 4-12, and 4-13, first notice that the HOM index has fluctuated quite drastically over the previous six months with very poor accomplishment in some months. The cumulative results of this poor monthly performance can be seen in the BEI metric which indicates that the baseline plan is not being adequately accomplished at a sufficient rate to achieve "on-time" project completion. Unfortunately, this typically means that additional resources (ie; added personnel, overtime, etc.) will have to be implemented to catch up from the behind-schedule situation. Next, notice in Figure 4-11, that the "cum actual completions" graph is tracking nearly the same as the baseline plan. This indicates that

there is a problem in that the wrong tasks are being worked, possibly tasks not yet scheduled to be worked per the baseline plan. If this situation continues over a span of several reporting periods then it is probably an indication that the baseline plan was not a viable plan to start with. Finally, in Figure 4-11, also notice that the current and baseline "cum" curves show a divergence indicating that numerous new tasks/milestones contained in the current IMS have not been incorporated into the baseline plan. The baseline schedule plan should be continually maintained and updated through the baseline change process to reflect the most current approved baseline plan. This analysis information should be reported to the project management team to determine resolve the issues identified.

Current Execution Index (CEI): This graphic (see Figure 4-14) displays schedule performance metrics that compare the number of actual schedule task completions to the total number of tasks that were forecasted to complete during the reporting period. CEI reflects a calculated performance index that results from the formula shown below.

CEI = # of tasks finished during the period / # of tasks forecasted to finish in the defined period

One key purpose for this indicator is to provide a means to measure project execution performance when there is no baseline plan to measure against. Or, when the established baseline is no longer a valid dataset to measure against. Another key reason for the CEI is determine how well the implementer is able to forecast the immediate upcoming work. Consistent use and reporting of this performance metric will serve as a proactive approach to improving near term forecasting of work which will over time enhance a project's chances of meeting or exceeding its schedule commitment.

The maximum index result is 1.0, but on-going performance achievement that is above 0.8 is considered acceptable.

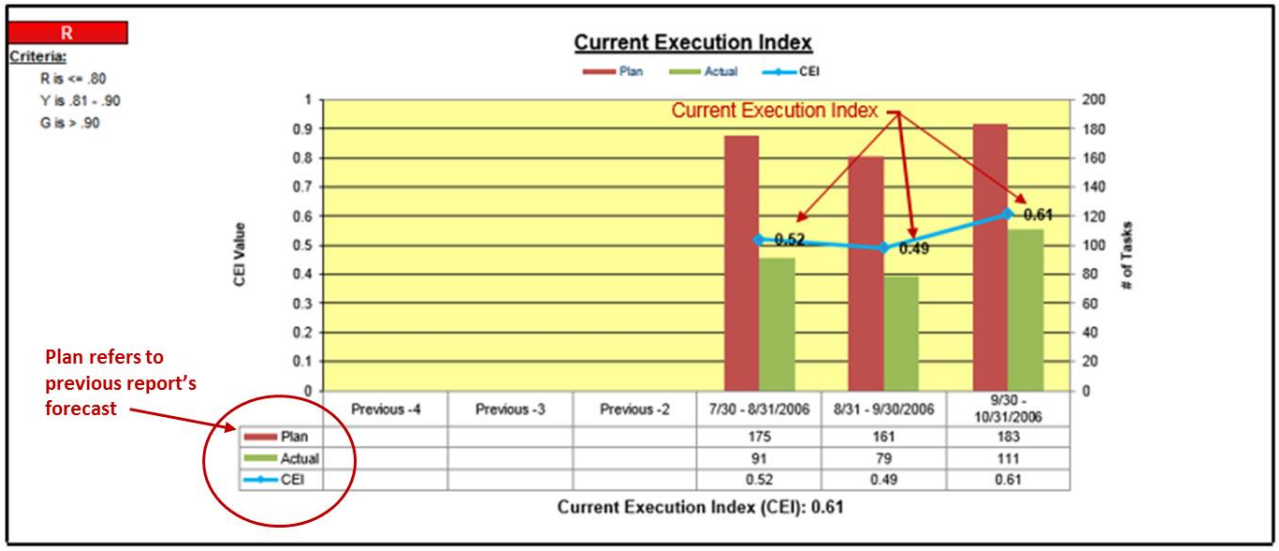


Figure 4-14: SASR – Current Execution Index (CEI)

Critical Path Analysis (top five paths): This graphic (see Figure 4-15) displays total slack (float) information for the five lowest slack paths contained in the project IMS. The lowest slack path is considered the primary critical path followed by the next four secondary paths. All five paths should be monitored closely on a continuing basis to ensure schedule validity. The management team should be aware of the specific tasks and milestones on each path and ensure that each assigned task duration and interdependency accurately reflects the planned implementation model. Caution should be used before making any analysis assumptions using the top five critical path data. It is very important to validate the credibility of each of the five paths contained in this metric. If the schedule Health Check indicates poor ratings for IMS formulation and integrity then this metric will be of lesser analysis value.

The stoplight rating for this metric is set so that Red will be reflected anytime the lowest path indicates that negative total slack exists. A Yellow rating will occur when the lowest path reflects total slack values that are between "0" days and "20" days. And a Green rating will occur if the lowest path shows "20" or more days of total slack.

The analysis information gleaned from this graphic is typically found in the slack values of each path and also the number of tasks contained in each path. Below are examples of analytical data that can be gained from this graphic along with the potential analysis conclusions that can be reached.

1) If, after validating the credibility of the five lowest paths, the primary critical path, as well as any of the secondary paths, have negative or significantly low total slack (float) values, then the project schedule may not reflect a feasible or realistic plan for success.

2) Many times the number of tasks making up the critical path is a good indicator of credibility. Assuming that the level of task detail across all WBS elements contained in the IMS should be consistent, then it is generally expected that the primary critical path will contain more tasks than the secondary paths. This is expected because, by definition, the primary critical path represents the longest duration path from the current status date through the IMS network to project completion. If this is not the case, then it potentially indicates either inconsistency in task detail or an invalid use of fixed task constraints.

As noted in the figure below, caution should be used when interpreting the data within this graphic because the credibility of slack calculations is totally dependent upon the formulation integrity and logical structure of the IMS. If the Schedule Health Check reflects a red stoplight rating then this metric will not provide much effective insight for management to use.

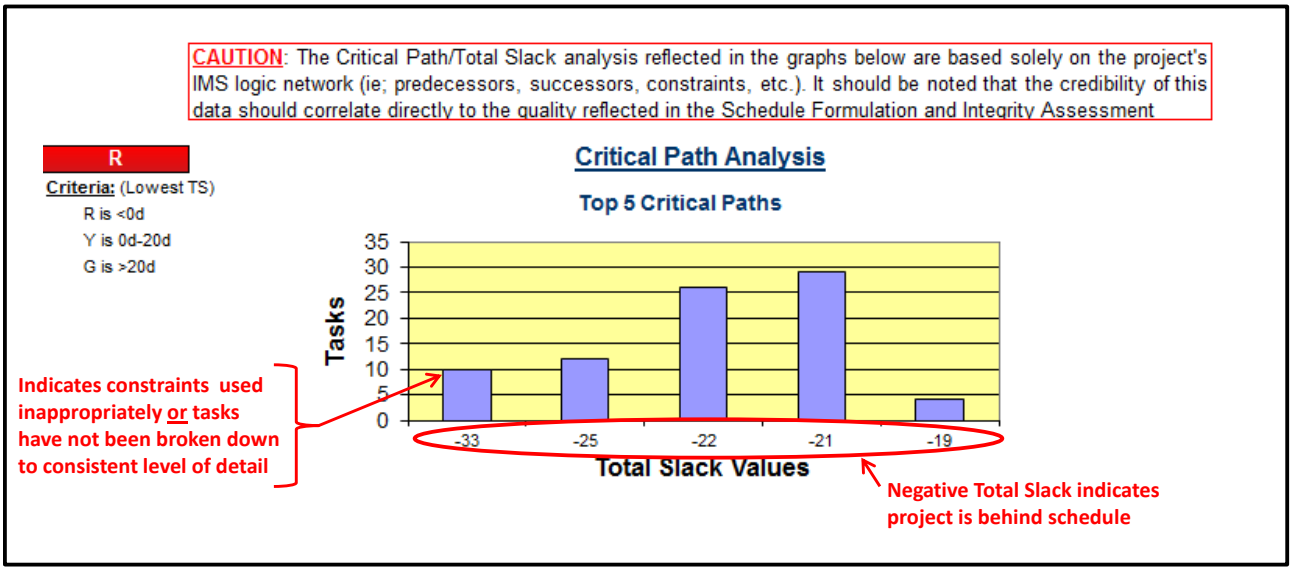


Figure 4-15: SASR – Critical Path Analysis Top 5 Critical Paths

Total Slack Analysis (Total Slack Categories): This graphic displays an overall snapshot of how the project IMS can be broken down into three categories of total slack (float) values for analysis and general information purposes (see Figure 4-16). The categories of slack are described below:

1) The first category indicates the total percentage of detailed schedule tasks/milestones contained in the IMS that have ten days or less of total slack. A general rule of thumb pertaining to this category indicates that less than 30% of the schedule should fall into this category. If tasks/milestones with ten days or less of total slack amount to 30% or more of the remaining IMS then it is highly probable that the project schedule is too optimistic and most likely unachievable. Schedule review and re-planning by the project team is recommended.

2) A second category indicates the total percentage of detailed schedule tasks within the IMS that have total slack values that are greater than 25% of the remaining project duration. In other words, this is a measure of how much of the project schedule has excessively high slack values. The analysis insight that comes from this category for situations where the resulting percentage is 30% or greater is that the schedule has not been sequenced properly. Interdependency relationships between tasks either have not been assigned at all or they have been assigned incorrectly. Encountering this situation should also result in a review of the IMS by the project management team.

3) The third category total slack values in this metric indicates the total percentage that makes up the balance of IMS tasks that are not falling into either of the above categories (see the center indicator in Figure 4-16). The analysis insight that can be gained from this category is that the resulting percentage of tasks that do not have too little or too much total slack should generally always be higher than either of the two categories described above. Any time this category is lower than either of the first two categories it becomes another indicator of poor or missing task interdependency relationships, or an overly optimistic schedule.

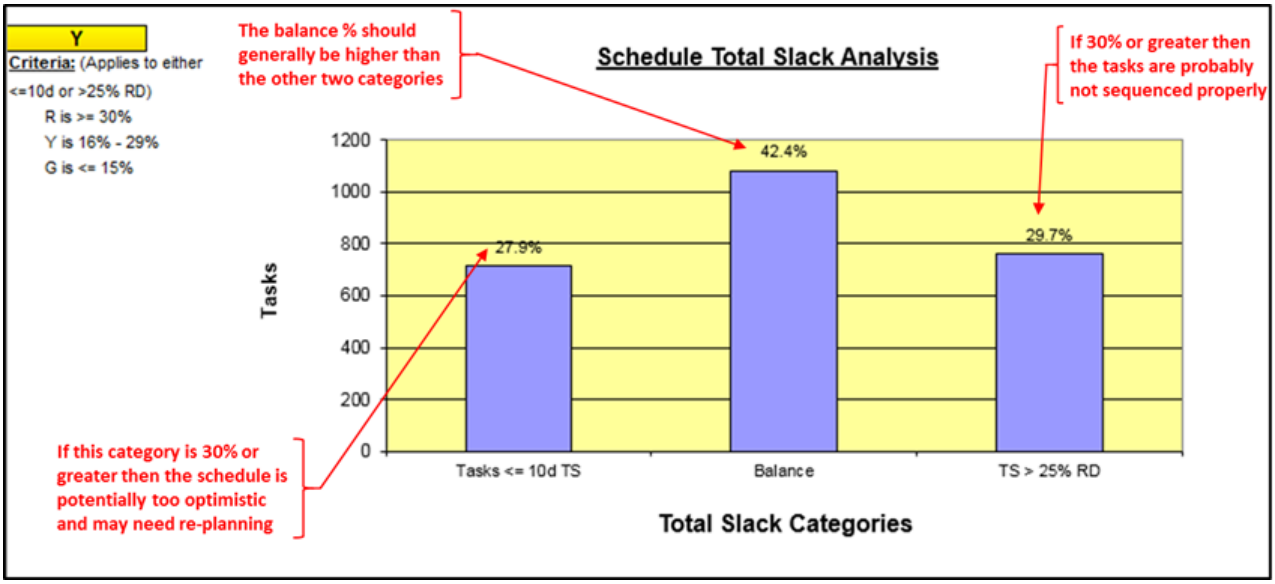


Figure 4-16: SASR – Schedule Total Slack Analysis

The stoplight rating for this metric is set so that Red will be reflected anytime *either* of the low or high total slack categories result in values of 30% or greater. A Yellow rating will occur when *either* of the low or high total slack categories result in values that are 16% to 29%. And a Green rating will occur when *both* the low and high total slack categories result in values of 15% or less.

Remaining Duration Profile: The assessment graphic below (Figure 4-17) provides a histogram which displays a profile of all remaining task/milestone durations. The importance of this information is to gain an understanding of the level of task detail contained in the IMS and make an assessment as to whether it is adequate or not. Generally, when task durations are long it is much more difficult to identify the specific interface points needed to allow for meaningful finish-to-start task relationships. The level of task detail within the IMS typically correlates to the development phase that the project is currently in. NASA projects in Pre-Phase A and also during portions of Phase A generally reflect less detail in task definition resulting in much longer durations. As a project proceeds into Phase B and also later phases, the project definition becomes much clearer and task durations should become shorter and more discrete allowing effective task interdependencies and meaningful progress/performance measurement. Within Phase B it is preferred that task durations for work during the upcoming 9-12 month period be kept at a level not exceeding 1-3 months. During Phase C it is preferred that the majority of task durations for the upcoming 9-12 months should not exceed one to two months in duration. It is understood that keeping with these goals is not always possible and that tasks should not be arbitrarily split when there are not logical and meaningful break points. It is important to understand that the more meaningful and discrete the level of task detail is, the more effective and accurate the IMS will be for determining critical schedule drivers, measuring project progress/performance, allocating resources, and forecasting future accomplishment. In simple terms it is recommended that the predominant number of tasks within an IMS should not exceed three months in duration, preferably less than two months.

Another industry best practice for the IMS is that it be structured in a task-oriented format. Milestones should be used for significant and meaningful project events. Using a task-oriented format enables the project team and their customers to have better insight into progress leading to task completions. If milestones are predominantly used in developing the IMS then correct logic development and accurate progress insight are many times more difficult to incorporate. Some organizations across industry have a goal of keeping the number of milestones within the IMS to less than 20% of the total number of detail items in the schedule.

The stoplight rating for task duration assessment has been set so that Red will be reflected if the percentage of tasks with durations greater than or equal to two months in length account for more than 20% of the remaining activities/milestones. A Yellow will occur when the percentage of tasks with durations of two months or greater accounts for 11% to 20% of the remaining schedule. And Green will occur when this percentage is less than or equal to 10%.

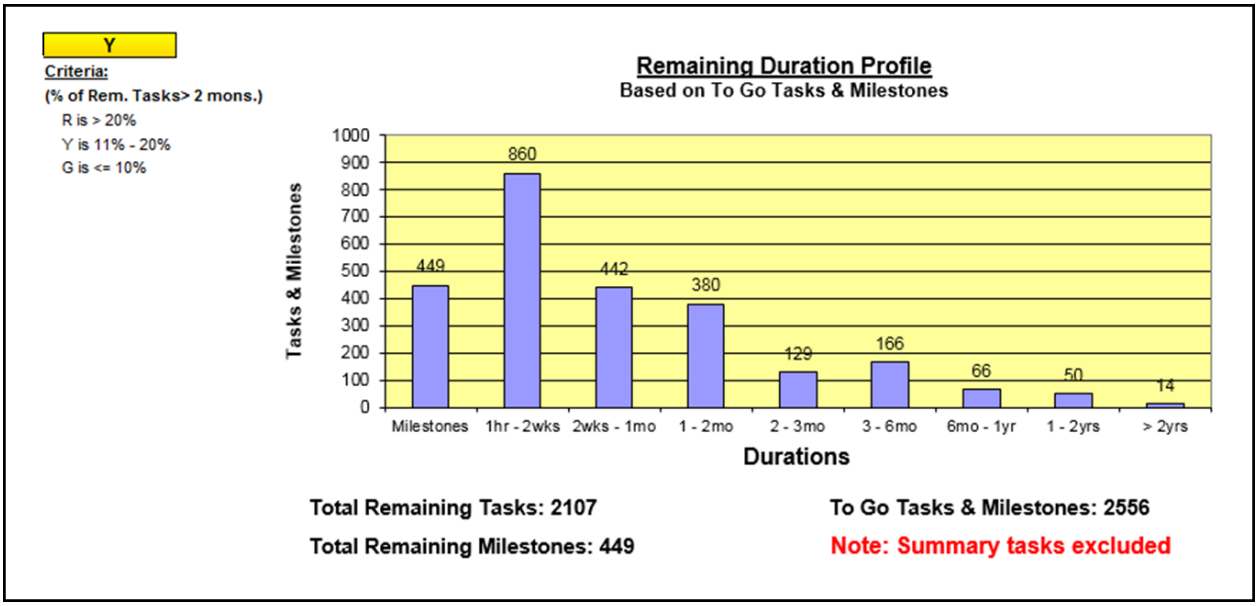
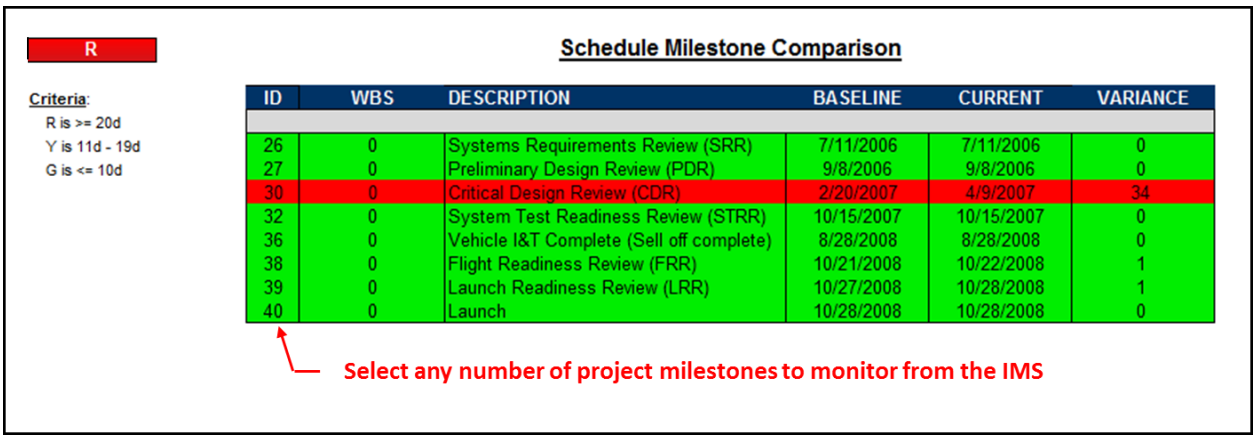


Figure 4-17: SASR – Remaining Duration Profile

Schedule Milestone Comparison: This graphic (see Figure 4-18) provides a basic status comparison metric for all selected milestone dates from the project schedule. The comparison reflects the baseline dates versus the current dates for the selected project milestones. The amount of schedule variance is also shown where the baseline and current schedules diverge. Red and yellow highlighting is added to flag those milestones where the schedule variance has significantly exceeded the established sufficiency criteria.

The stoplight rating that is set for this metric is as follows for the selected project milestones within the schedule. A Red will be reflected when *any* of the selected milestones have slipped 20 or more workdays from the baseline dates. A Yellow will occur when any milestone slips from 11 to 19

workdays from the baseline dates. And a Green occurs when the milestone slip is less than or equal to 10 workdays.



ID	WBS	DESCRIPTION	BASELINE	CURRENT	VARIANCE
26	0	Systems Requirements Review (SRR)	7/11/2006	7/11/2006	0
27	0	Preliminary Design Review (PDR)	9/8/2006	9/8/2006	0
30	0	Critical Design Review (CDR)	2/20/2007	4/9/2007	34
32	0	System Test Readiness Review (STRR)	10/15/2007	10/15/2007	0
36	0	Vehicle I&T Complete (Sell off complete)	8/28/2008	8/28/2008	0
38	0	Flight Readiness Review (FRR)	10/21/2008	10/22/2008	1
39	0	Launch Readiness Review (LRR)	10/27/2008	10/28/2008	1
40	0	Launch	10/28/2008	10/28/2008	0

Figure 4-18: SASR - Schedule Milestone Comparison

SASR Management Overview Report (2 pages): This two-page management report (see Figures 4-19, 20) provides both thumbnail graphics of the above metrics along with narrative assessment explanations provided by the schedule analyst. This report allows the scheduler to explain in understandable terms the meaning of each metric along with the appropriate analysis conclusions as they relate to the project.

Management Overview Report (Page 1)

Provides a format for brief analysis explanation for management reporting

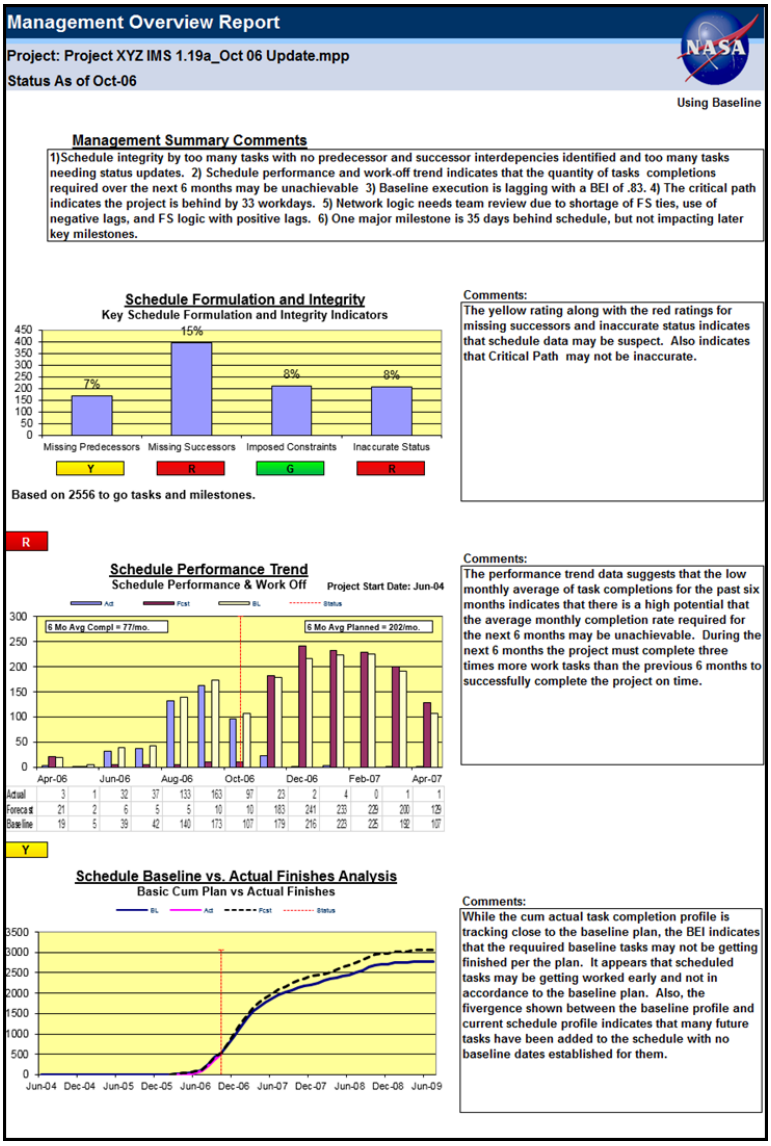


Figure 4-19: SASR – Management Overview Report (Page One)

Management Overview Report (Page 2)

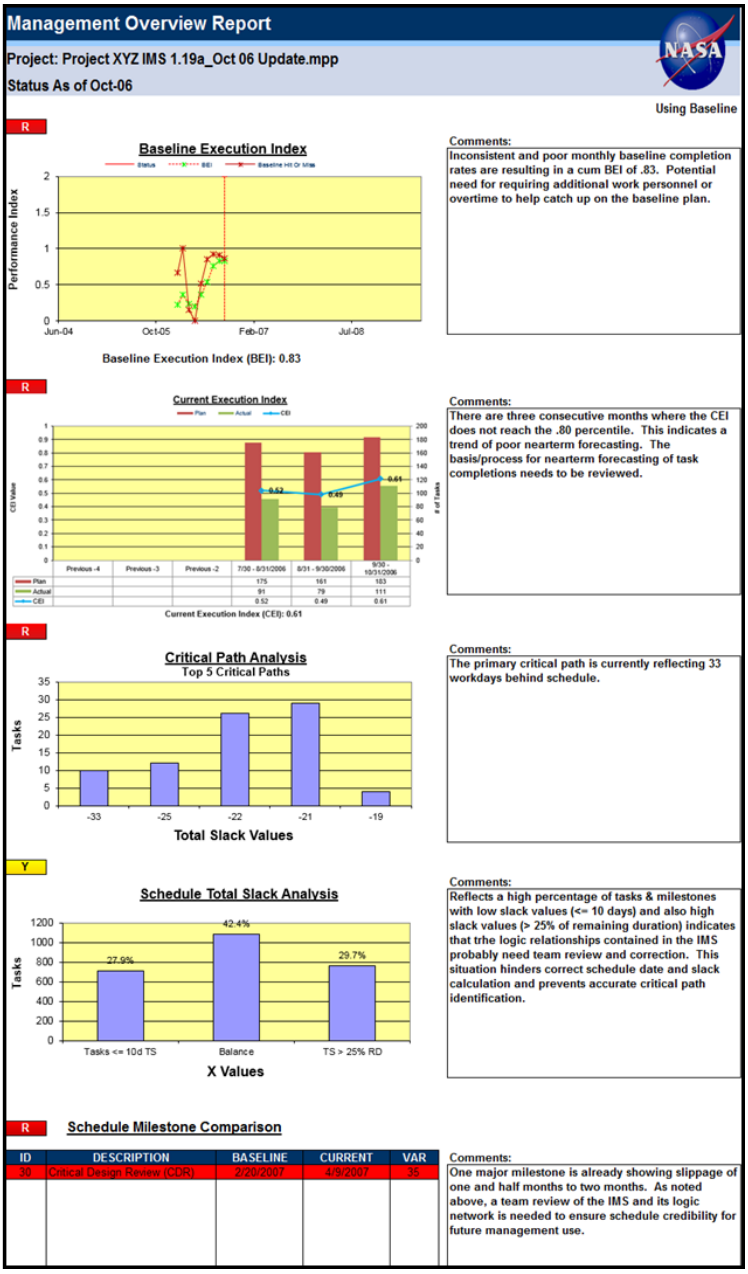


Figure 4-20: SASR – Management Overview Report (Page Two)

Section 5: The Schedule Performance and Work-Off Trend

Initiating the Schedule Performance and Work-Off Trend

The purpose of the Schedule Performance and Work-Off Trend is to provide the user with very quick visibility into how tasks and milestones stack up on a monthly basis within the project IMS. It reflects not only the baseline plan, but also actual accomplishment too date, and the schedule profile of how all remaining project tasks are scheduled to be worked in the future. This trend analysis report provides objective schedule data to assist in the assessment of IMS credibility.

To initiate this assessment function, select the Trend Analysis icon from the MS Project toolbar (see Figure 5-1). The icon initiates the Trend Analysis Wizard.

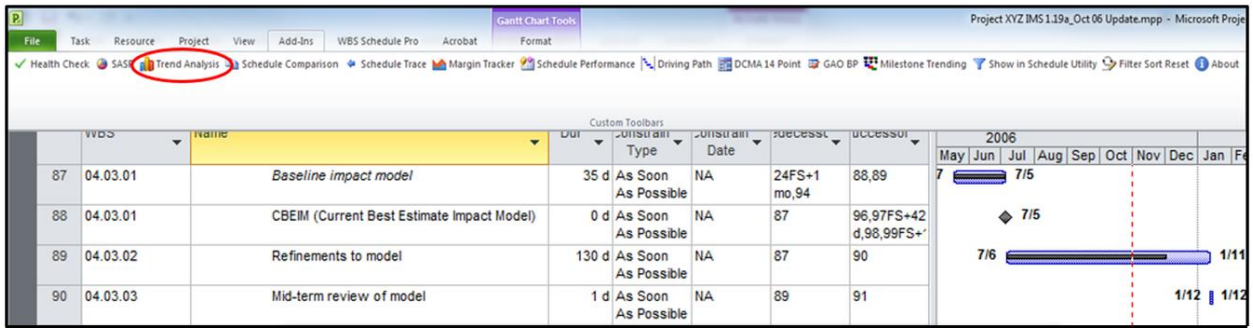


Figure 5-1: Performance and Work-Off Trend Tool Bar Selection

Step 1 of the Trend Analysis wizard dialogue box allows the user to set the schedule "Status Date" on which the resulting performance and work-off trend data will be based. *Note: The schedule should reflect a Status Date that represents the most current date for which the schedule has been progressed through.* If the date is missing or obviously incorrect it should be added or changed. Also on this step of the wizard the user can select the baseline to use in plotting the Scheduled Baseline Tasks. The Baseline is the default but Baseline 1-10 can also be selected. See Figure 5-2.

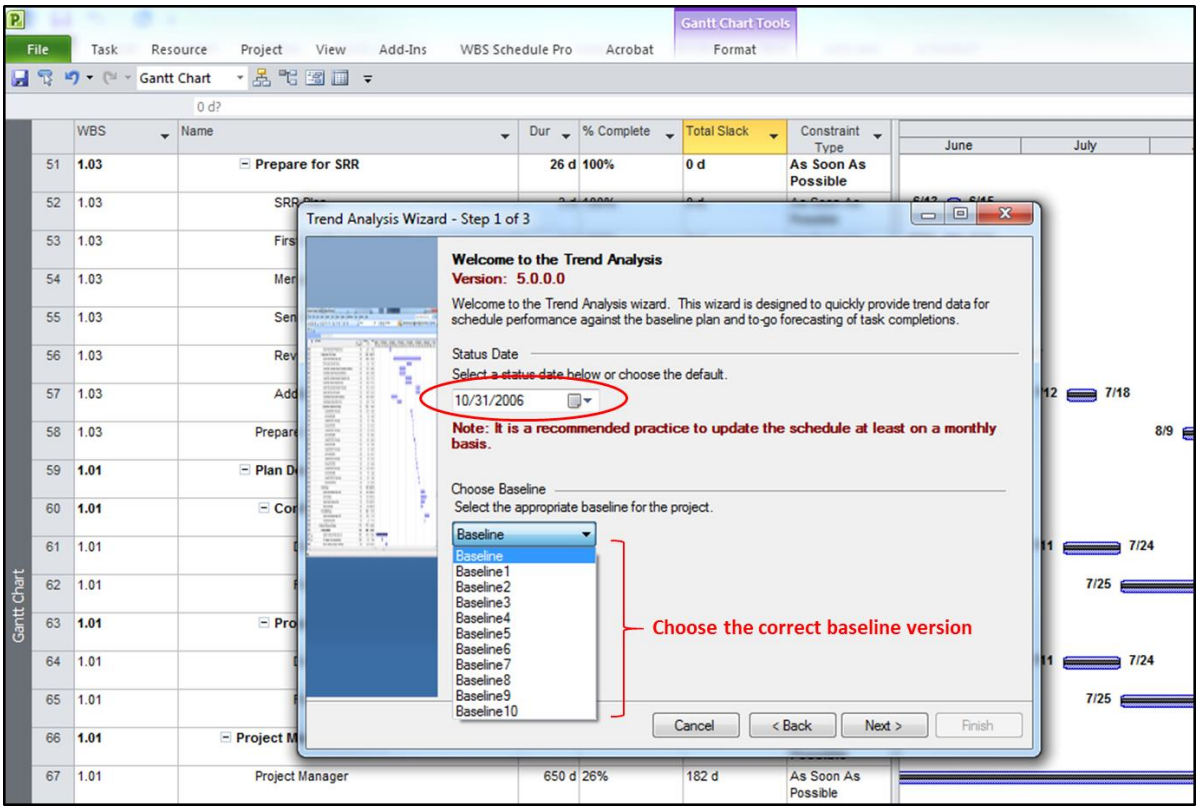


Figure 5-2: Performance and Work-Off Trend Wizard Step 1

Step 2 of the wizard dialogue box (See Figure 5-3) provides a browse function to allow the user to select the location where they wish the performance and work-off output file to be stored. In the center of the dialogue box the user may choose to produce a trend report containing a macro function allowing the user to zoom in on a more specific span of time to be reflected in the graphic. This provides improved clarity in the data being reported. Within the report file the macro function is activated by selecting the start date and end date of the span you are interested in and then click the zoom button. If the user's IT environment does not allow the use of macros within Excel, then they can choose the "Non-Macro" version which provides another method of selecting the desired start date and end date of the span you are interested in (see Figure 5-4)

At the bottom of the dialogue box the filter selection allows the user to use the currently set filters or use no filters. "Use No Filters" is the default setting and will remove all filters and analyze the complete schedule. If the "Use Current Filters" is selected the filter that is set in the schedule and any Auto Filters will remain in effect and only the selected portion of the schedule will be analyzed.

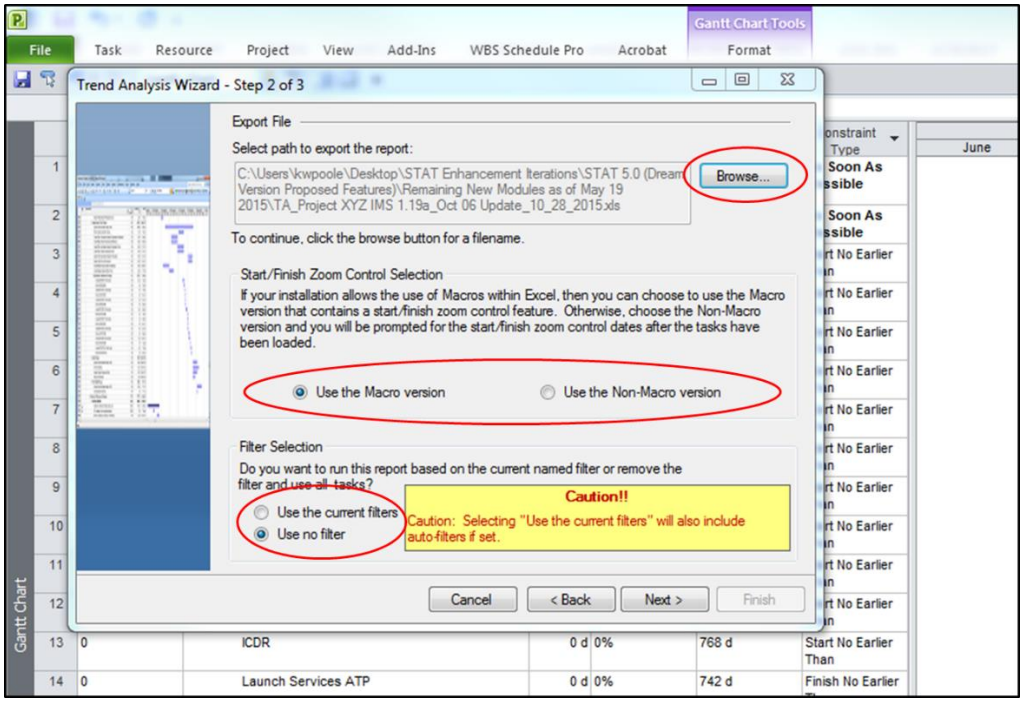


Figure 5-3: Performance and Work-Off Trend Wizard Step 2

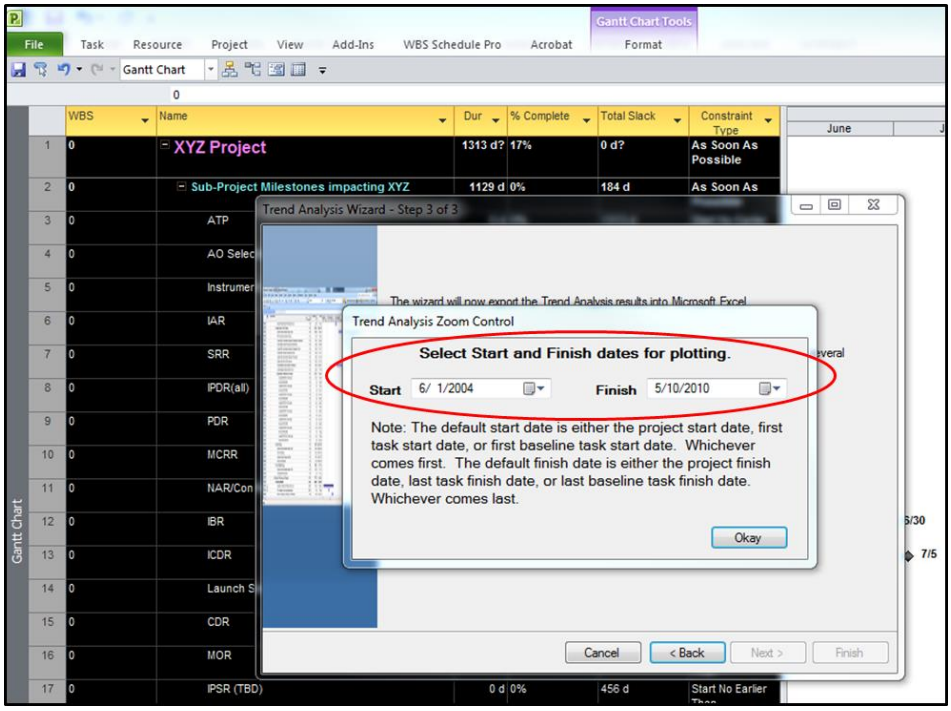


Figure 5-4: Performance and Work-Off Trend Wizard Step 3

Step 3 of the Trend Analysis Wizard produces a final dialogue box that allows the user to complete the final step in initiating the Performance and Work-Off Trend Analysis. This dialogue box informs the user that Microsoft Excel 2000 or later must be installed. The user is also informed that the processing time for transferring the data results into the Excel template may take several minutes if the schedule file size is very large.

Select finish to complete the Performance and Work-Off Trend processing and compilation of the assessment data. The STAT tool will then process the schedule data to produce a histogram profile within excels that shows how the scheduled tasks and milestones stack up by month for the duration of the project. See Figure 5-4.

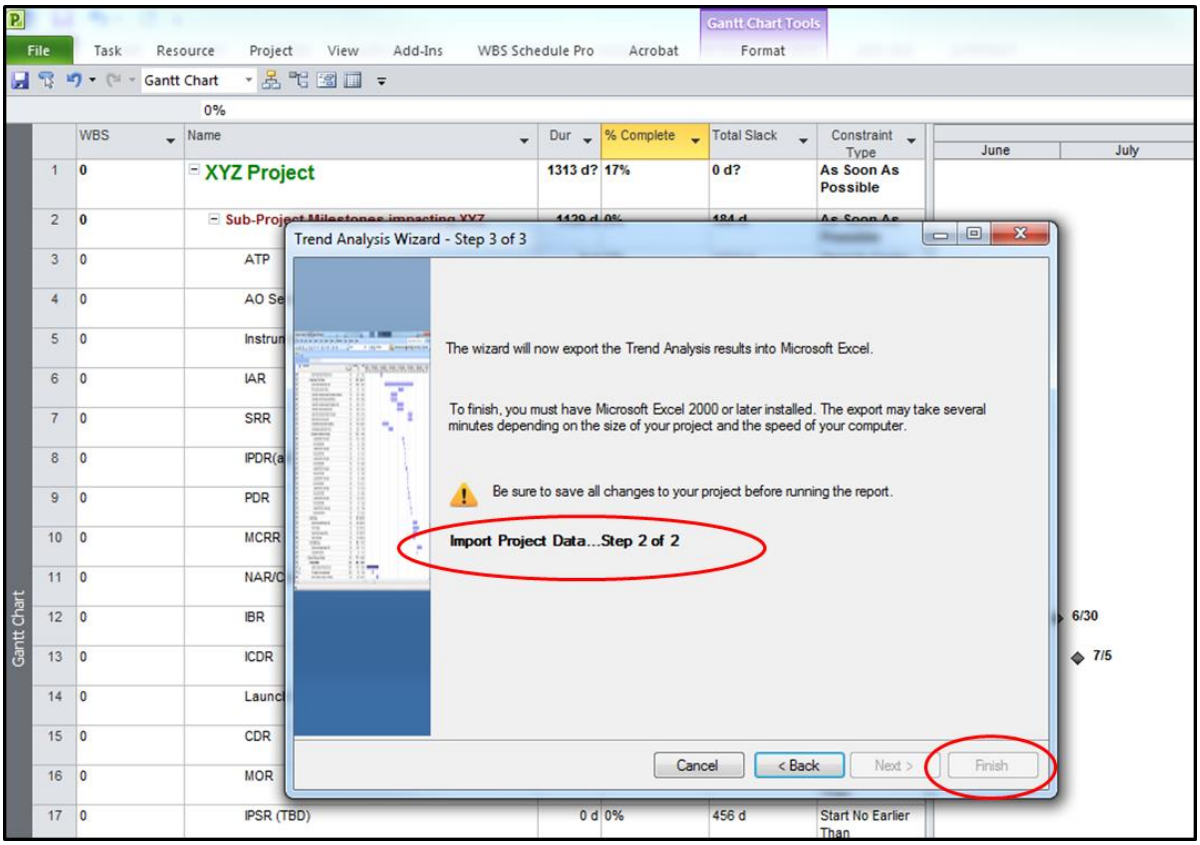


Figure 5-5: Performance and Work-Off Trend Wizard Step 3

If you get the error shown in Figure 5-6 refer to step seven of ***Section 2: Software Installation*.**

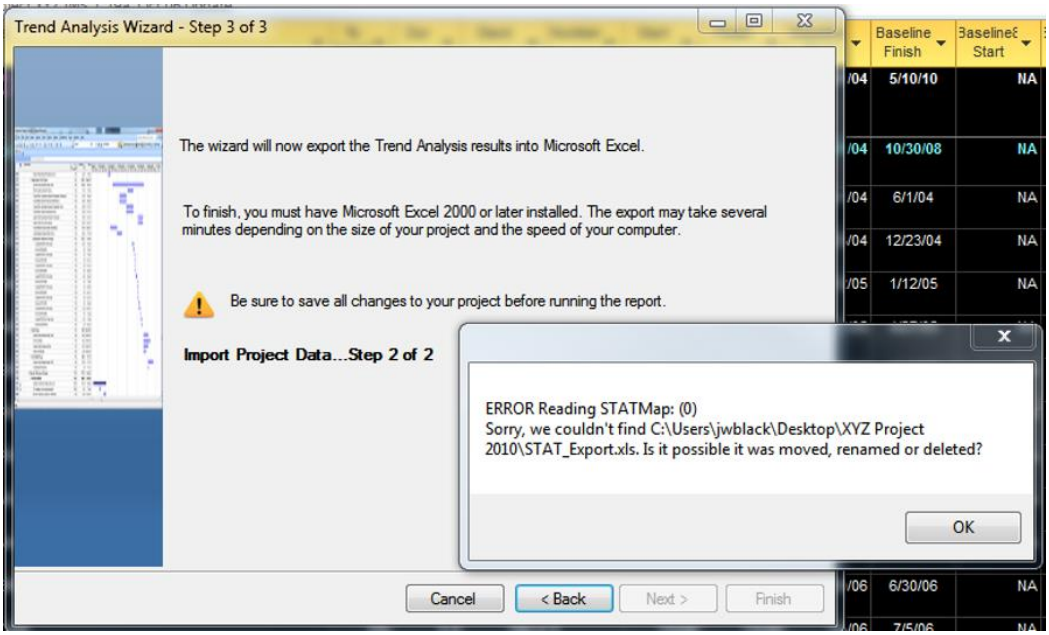


Figure 5-6: Allow Legacy file formats Error

Understanding Schedule Performance and Work-Off Trend Results

The performance and work-off trend data provides the user with objective information relative to past schedule achievements and to-go schedule forecasts while at the same time comparing to the IMS baseline plan. The illustration below (Figure 5-7) provides visibility for the overall duration of the project to assist the scheduler and project team in determining if the planned schedule execution profile looks reasonable and achievable. Assessing the peaks and valleys of the profile can sometimes be helpful when comparing to a project's labor profile to determine if there is a correlation or consistency in time phasing that exists between the number of tasks scheduled to complete each month and the amount of labor required to complete those tasks. This metric can also identify and highlight where unrealistic bow-waves of scheduled work exists. Where bow-waves do exist, it is recommended that appropriate project team members review and revise the schedule as-needed to ensure data credibility for management decision making. Actual completion performance is also visible in this graphic to help in establishing performance trends that assist in evaluating chances for future schedule success.

Other helpful information displayed on the performance and work-off trend are tasks and milestones that have been scheduled to be worked, but are not progressed as time passes. The result of this practice is that incomplete schedule tasks are continued to be reflected to the left of time-now, or in past history. It should be noted that this practice is not satisfactory for sound schedule management. In order to maintain schedule accuracy and critical path credibility, it is crucial that all tasks/milestones that were previously scheduled to have been started or completed prior to time-now, be assigned with new forecast start/completion dates in the future if previous scheduled dates were not achieved. Tasks with inaccurate status, as described above, will hinder meaningful and effective schedule analysis.

As explained above, the Schedule Performance & Work-Off Trend report also provides a zoom function. This feature allows the user to select a more specific span of time to be reflected in the graphic which provides improved clarity in the data being reported (see Figure 5-8). The function is activated by selecting the start date and end date of the span you are interested in and then click the zoom button.

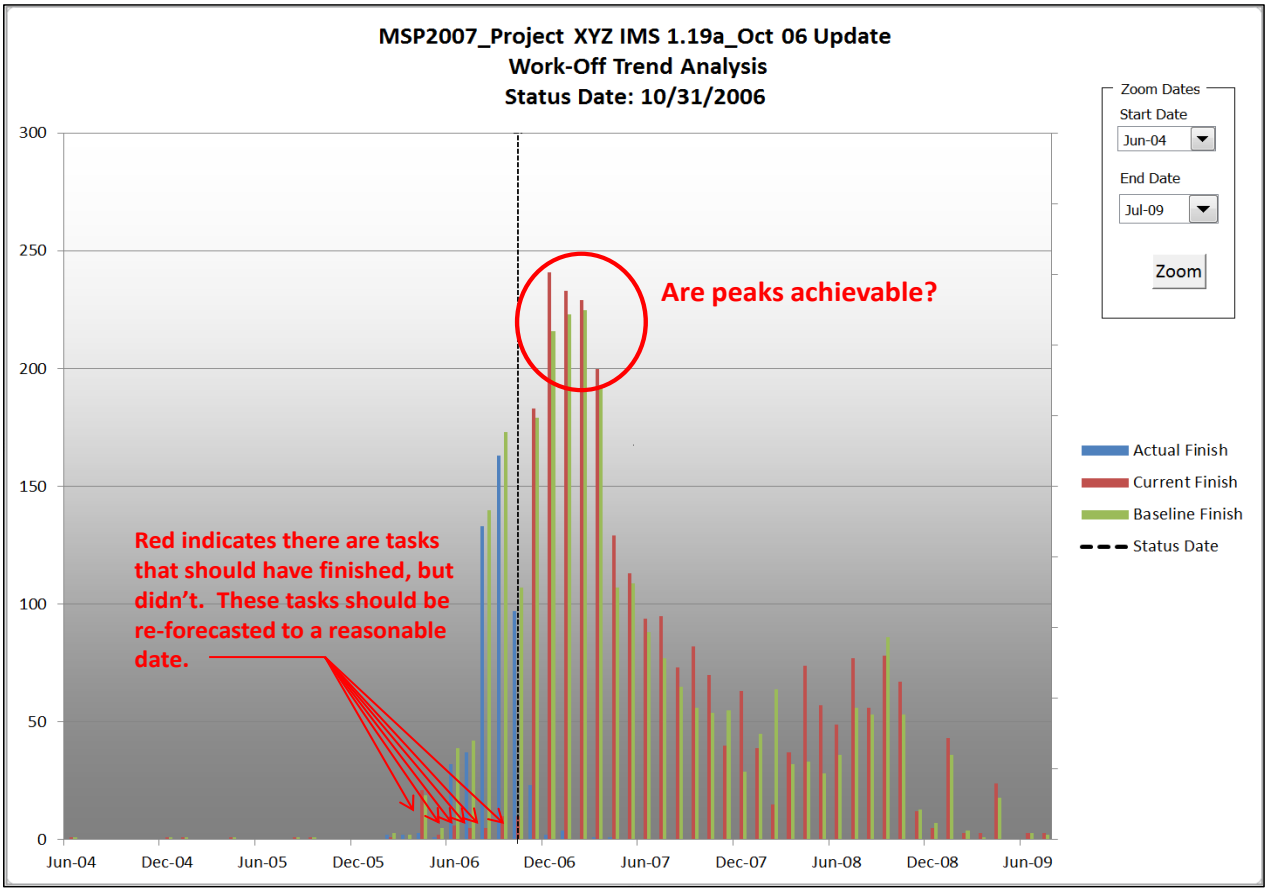


Figure 5-7: Schedule Performance & Work-Off Trend Illustration

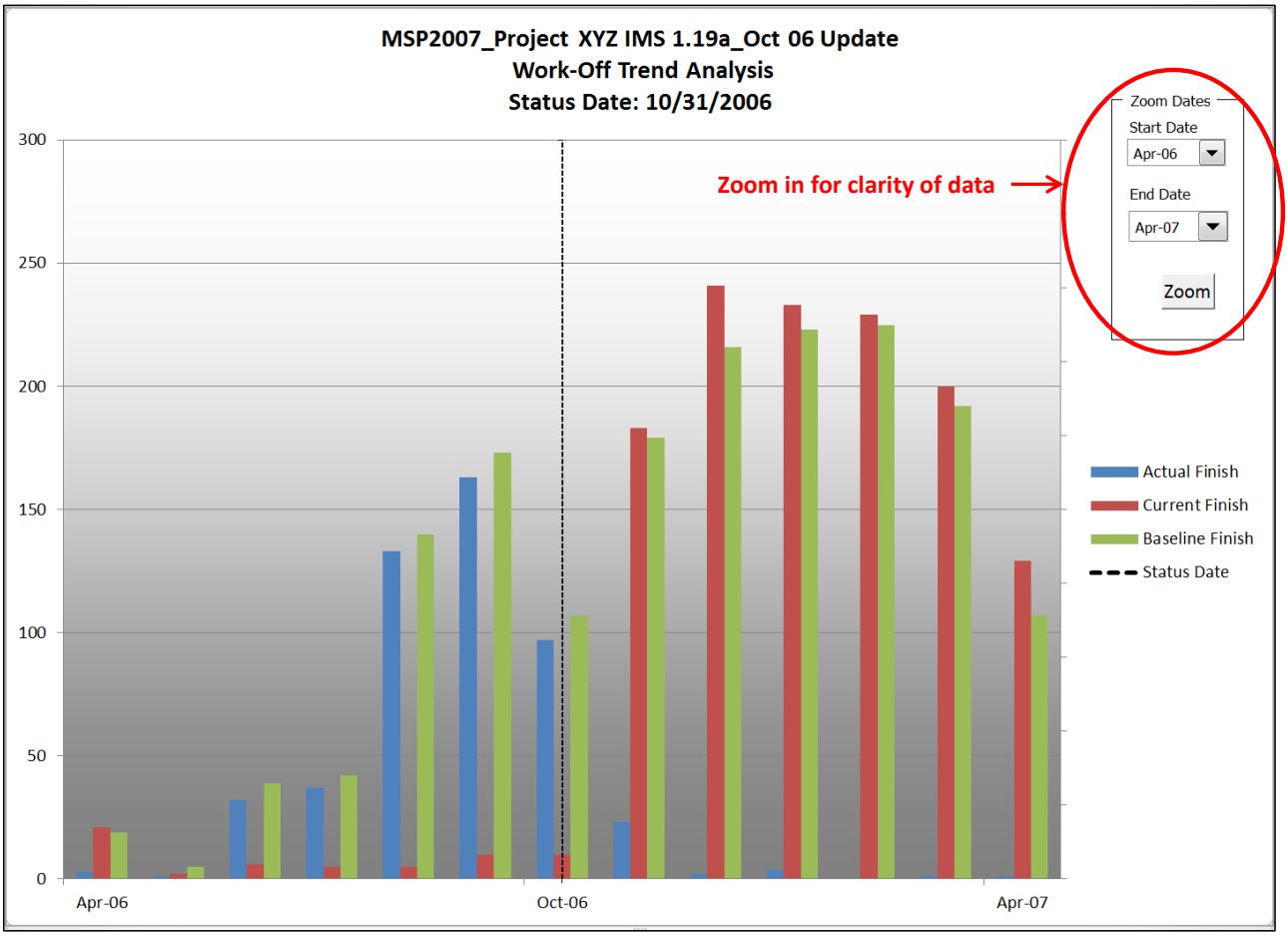


Figure 5-8: Performance & Work-Off Trend Zoom Illustration

Section 6: Schedule Comparison

Initiating Schedule Comparison:

The purpose of the Schedule Compare function is to provide the user with a very quick assessment of important changes that may have occurred between two versions of a schedule. Many times the amount of data content contained within a schedule is so robust that it is impossible to know what all has changed from one update to the next. This module is designed to identify the key changes that have been made and to provide a listing of those details for the planner/scheduler to use in analyzing the impacts that result from those changes.

The Schedule Comparison module compares two schedule files and identifies changes that have been made to the following key schedule details:

1. New Tasks
2. Deleted Tasks

3. Duration Changes
4. Constraint Changes
5. Constraint Date Changes
6. Task Name Changes
7. Resource Name Changes
8. Predecessor Changes
9. Successor Changes
10. Baseline Start Changes
11. Baseline Finish Changes
12. Lag Changes (positive & negative)

To initiate this assessment function, select the Schedule Comparison icon from the MS Project toolbar (see Figure 6-1). This icon initiates a three step wizard that allows the user to make the needed parameter selections which leads to the output report to be used for schedule analysis. The wizard steps are illustrated and explained below.

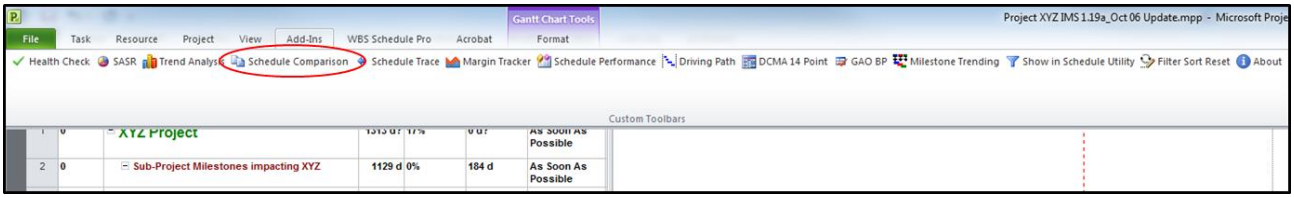


Figure 6-1: Schedule Comparison Icon Illustration

Step 1 produces a wizard dialogue box that allows the user to set the schedule "Status Date" on which the schedule comparison data will be based. After selecting the desired status date click "Next" (see Figure 6-2). *Note: The schedule should have a Status Date that represents the "as-of" date which the schedule was updated through*. If that date is missing or obviously incorrect it should be added/changed. Also, the user can select the desired baseline version to use in comparing the correct schedule baseline information. The version denoted as "Baseline" is the default, if no other version is selected, but Baseline versions 1-10 can also be selected. *Always make sure that the same baseline version is selected in the two schedule files being compared*. This will ensure consistent baseline data is being compared and prevent erroneous differences being reflected in the output report

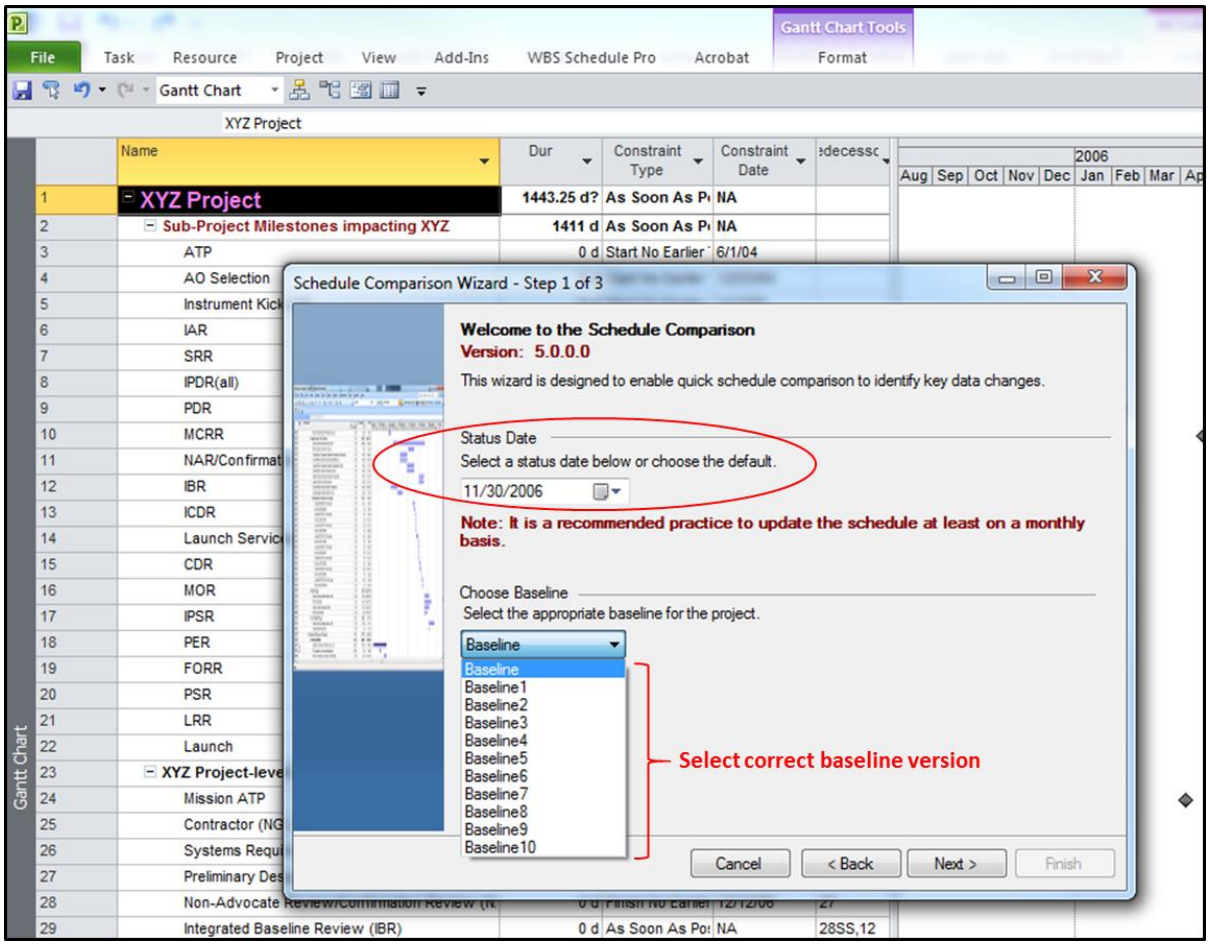


Figure 6-2: Schedule Comparison Wizard Step 1

Step 2 of the Schedule Comparison Wizard produces a dialogue box (see figure 6-3) that provides the user with the capability for browsing to select a prior schedule to be compared with. The dialogue box also provides a browse function to allow the user to select the location where they wish to store the final resulting comparison output report. The filter selection allows the user to use the currently set filters or use no filters. Use No Filters is the default setting and will remove all filters and analyze the complete schedule. If the Use Current Filters is selected the filter that is set in the schedule and any Auto Filters will remain in effect and only the selected portion of the schedule will be analyzed.

After selecting the desired step 2 choices, click next.

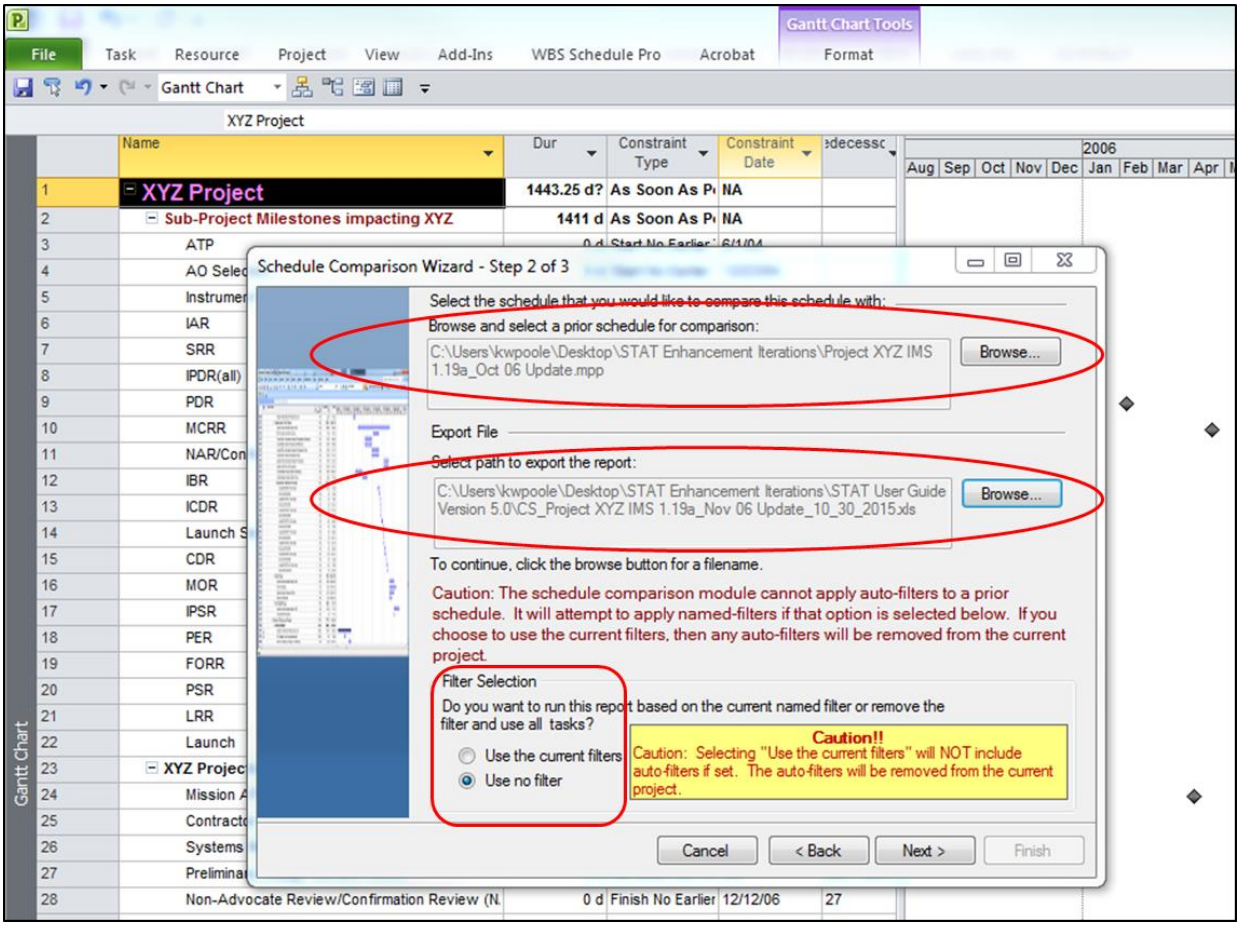


Figure 6-3: Schedule Comparison Wizard Step 2

Step 3 of the Schedule Comparison Wizard produces a final dialogue box (See Figure 6-4) that allows the user to complete the final step in initiating the desired comparison output report. This dialogue box informs the user that Microsoft Excel 2000 or later must be installed. The user is also informed that the processing time for transferring the data results into the Excel template may take several minutes if the schedule file size is very large. Information is also provided to alert the user on the processing status of the gathering and formatting of data into an output report.

Click finish to complete the Schedule Comparison processing and compilation of the assessment data. The STAT tool will then process the schedule data to produce the comparison results within excel that shows the specific key schedule details that have changed from a previous schedule iteration and the current update.

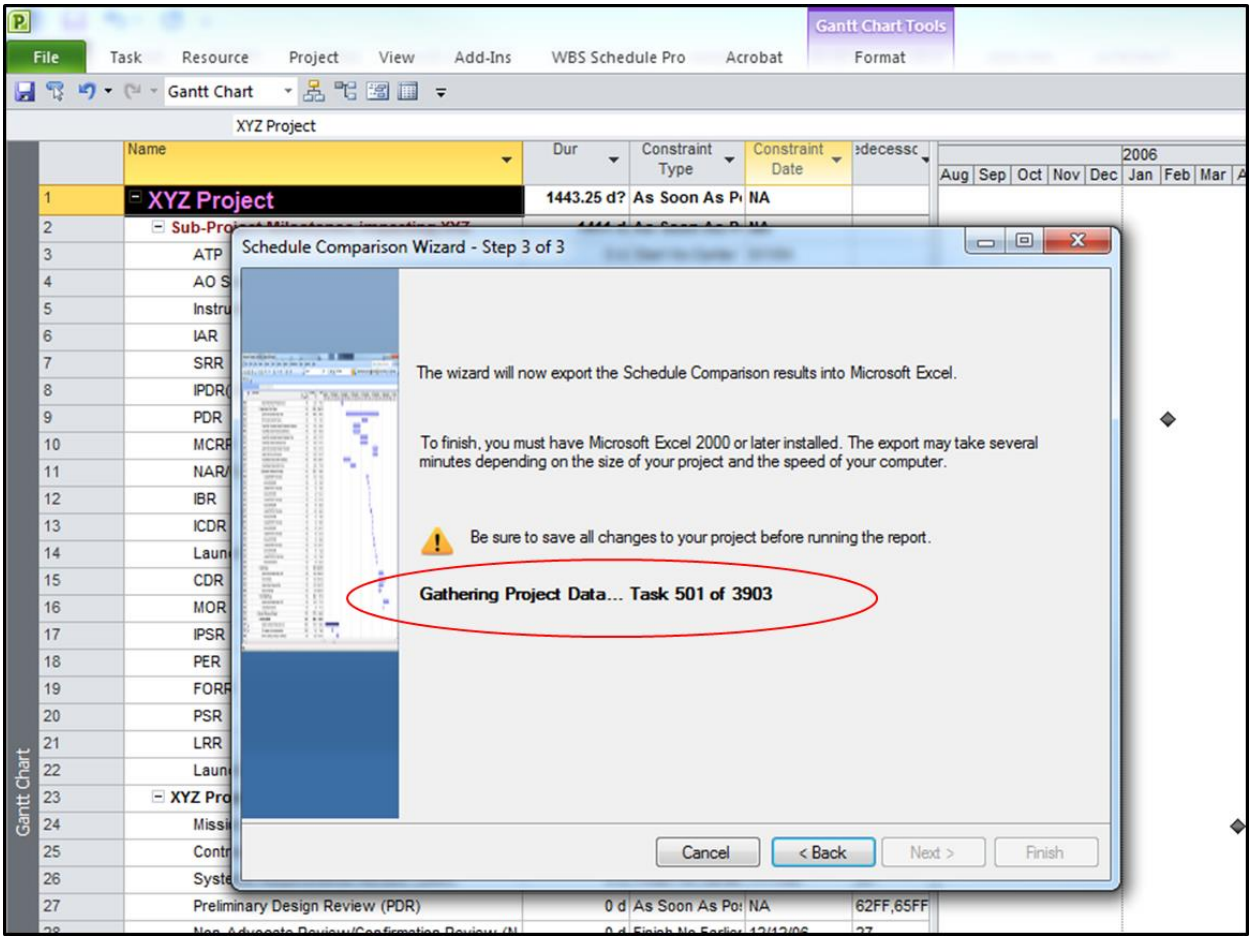


Figure 6-4: Schedule Comparison Wizard Step 3

Understanding Schedule Comparison Results

In the normal routine rhythm of project schedule updates and maintenance, there are potentially many changes made by many different people that can significantly impact the validity of the resulting data reflected in the project schedule. During this process, there is also a high potential for inadvertent errors and/or incorrect changes that get incorporated that may also impact the schedule's validity. Due to these dynamics of schedule management, the schedule owner must always have a clear understanding of what has changed in his/her project schedule and why so that proper and accurate analysis can be done to ensure the credibility of schedule data produced and provided to the project management team.

A Schedule Comparison output report is shown below (see Figure 6-5) which identifies the two schedules being compared, and also the quantities of changes found for the eleven key types of schedules changes noted above. Additionally, the report provides a listing of all the specific task/milestone details that have been changed so that the user can more easily find the cause of unexpected schedule results or issues that must be addressed and corrected.

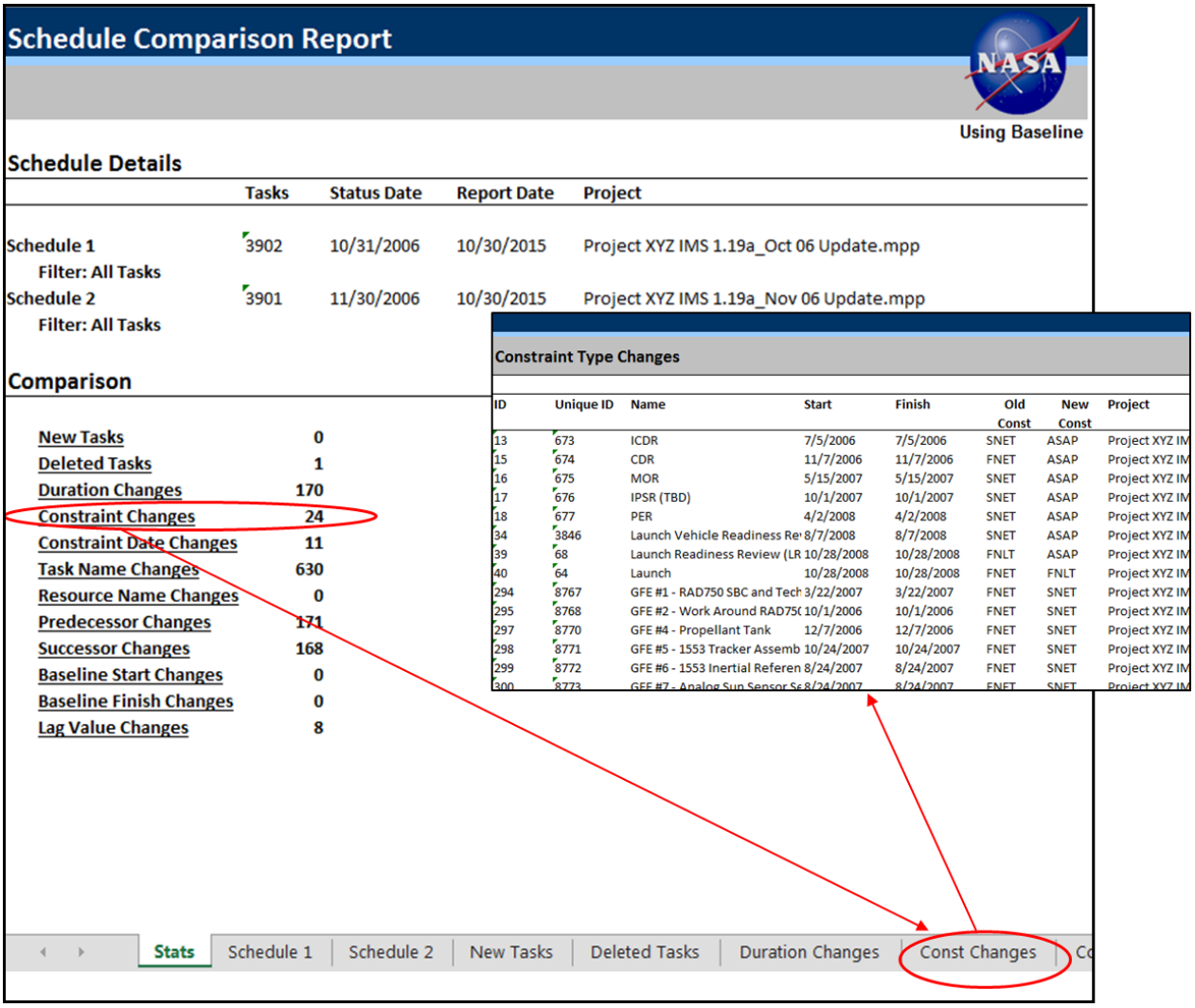


Figure 6-5: Schedule Comparison Output Report Illustration

Section 7: Schedule Trace

Initiating Schedule Trace

The purpose of the Schedule Trace Program is to provide the user with a quick look into which activities are required to complete a selected task, based on the network logic. When all the tasks required to complete the end points are determined any remaining tasks are identified that are not linked to any of the selected tasks. A summary page is produced in excel and a tab with the list of tasks for each end point is provided. Also a tab with the tasks that are not linked to any selected end point is included. This data can also be used to determine if the schedule logic is sound enough to perform a Schedule Risk Assessment (SRA) or Joint Confidence Level (JCL) analysis.

To initiate this assessment function, select the Schedule Trace icon from the MS Project toolbar (see Figure 7-1). The icon initiates the Schedule Trace Wizard.

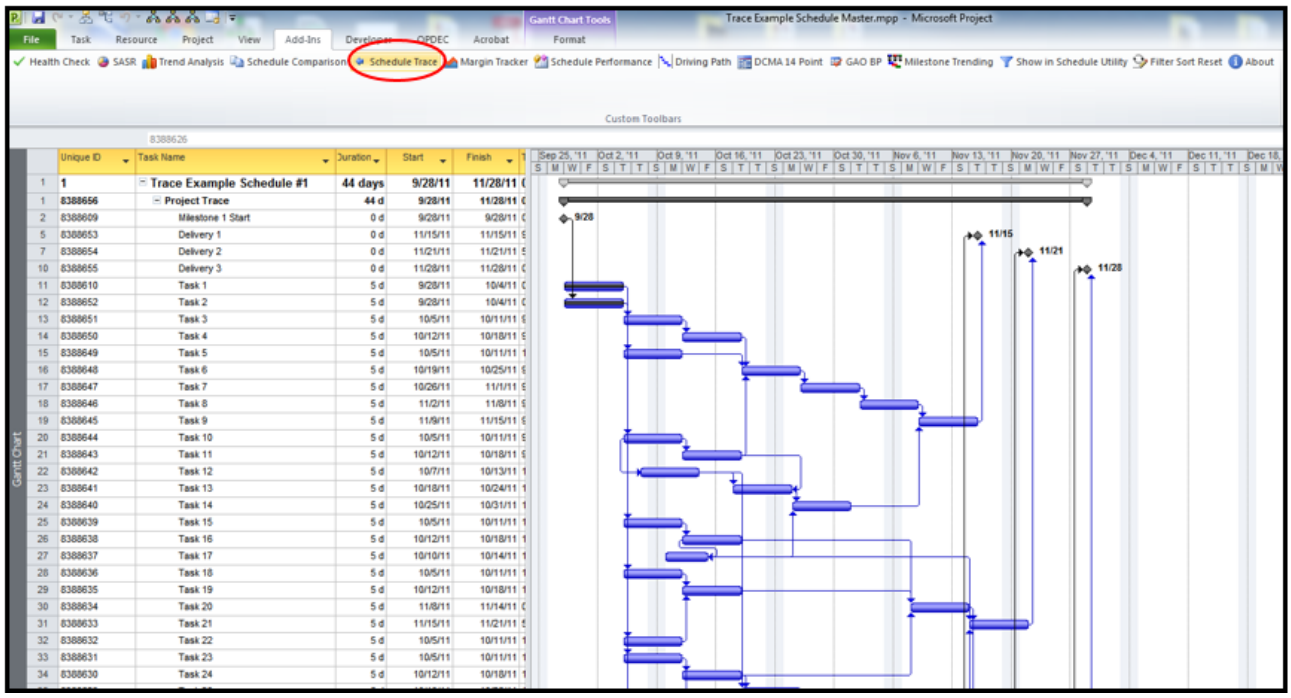


Figure 7-1: Schedule Trace Tool Bar Selection

Step 1 of the Schedule Trace wizard dialogue box (Figure 7-2) allows the user to set the schedule "Status Date" on which the resulting schedule trace data will be based. *Note: The schedule should reflect a Status Date that represents the most current date for which the schedule has been progressed through.* If the date is missing or obviously incorrect it should be added or changed. Click the "Next" box to proceed.

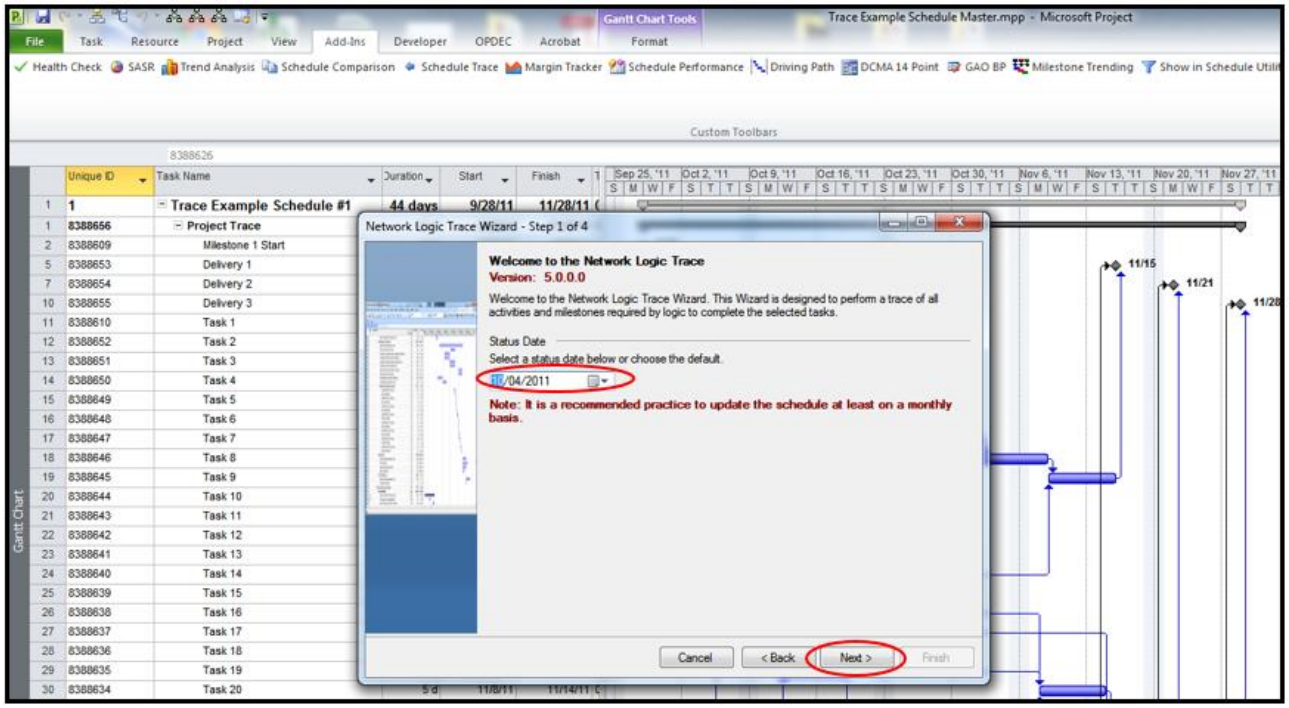


Figure 7-2: Schedule Trace Wizard Step 1

Step 2 of the wizard dialogue box (Figure 7-3) provides two options. A browse function to allow the user to select the location where they wish the final output file to be stored and the filter selection that allows the user to use the currently set filters or use no filters. Use No Filters is the default setting and will remove all filters and analyze the complete schedule. If the Use Current Filters is selected the filter that is set in the schedule and any Auto Filters will remain in effect and only the selected portion of the schedule will be analyzed.

After selecting the desired step 2 choices, click "Next".

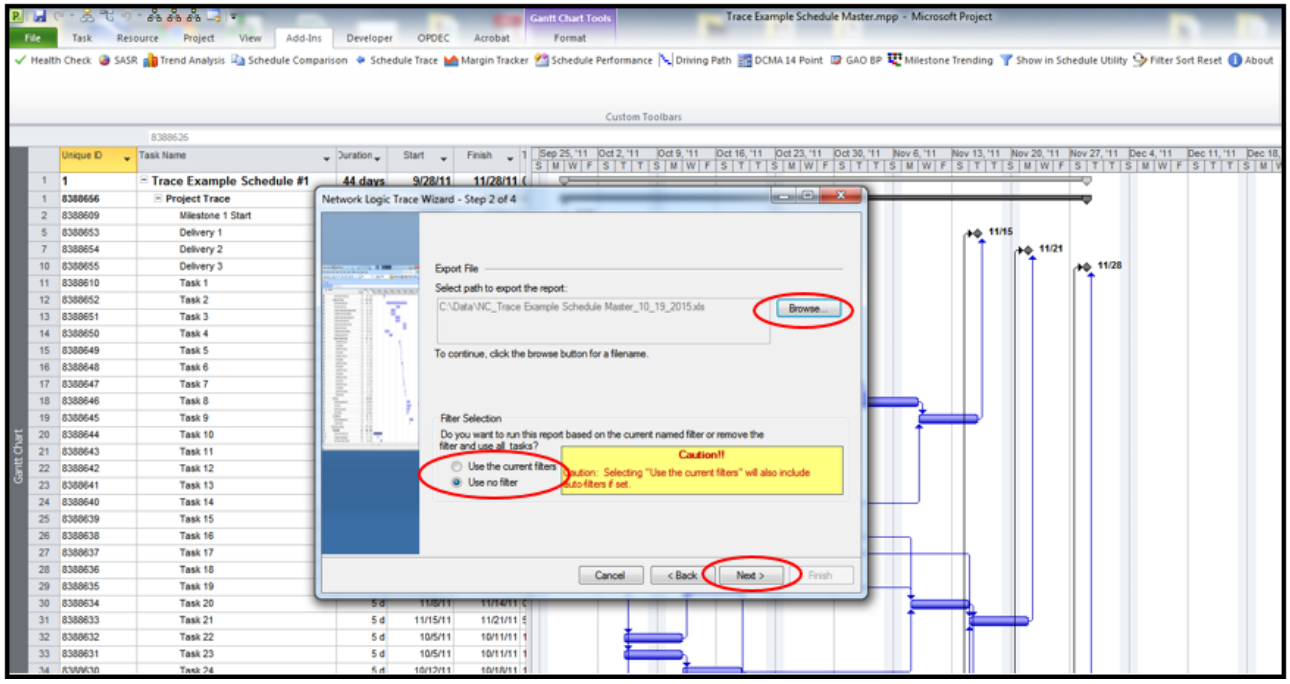


Figure 7-3: Schedule Trace Wizard Step 2

Step 3 of the Schedule Trace wizard dialogue box (Figure 7-3) allows the user to select the end points to be traced back from. Up to 10 activities can be selected by ID or Unique ID by clicking on the radial buttons Unique ID or ID. If the ID is used with a Master/Subproject schedule you may get multiple activates added to the list. If this occurs select the unwanted activities and click the Remove box. The box for "Exclude tasks from earlier listed traces in trace output" is checked by default but can be changed if you would like to see all the tasks that are included in previous traces listed on the trace tabs.
Click the "Next" box to proceed.

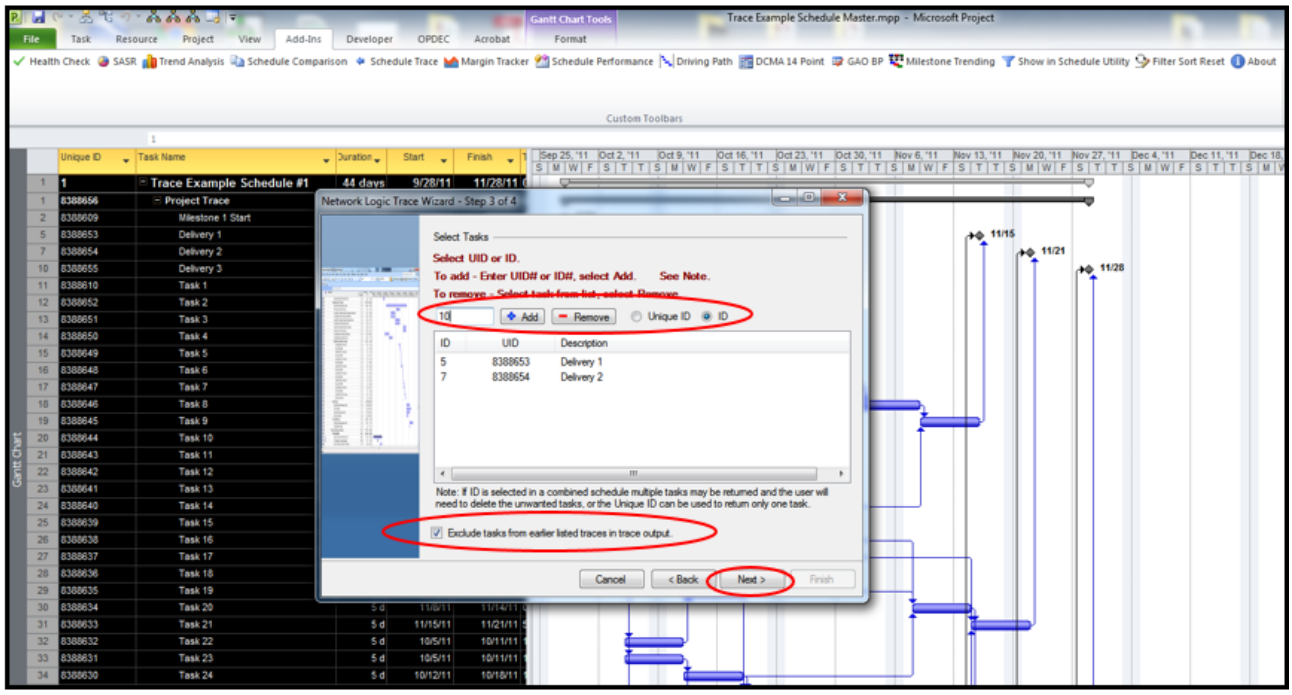


Figure 7-4: Schedule Trace Wizard Step 3

Step 4 of the Schedule Trace wizard dialogue box (Figure 7-5) provides the option to back up and make changes or click the "Finish" box to process the schedule data to produce the output in an excel file. A processing status will be provided as the output file is being processed.

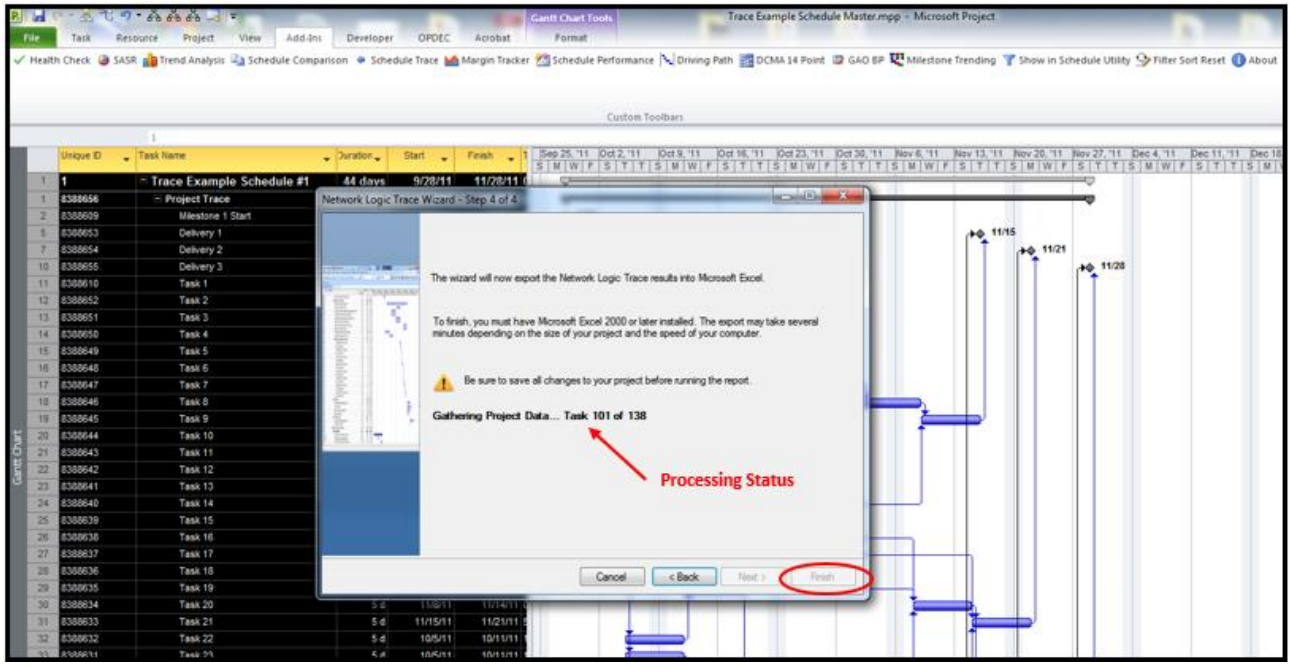
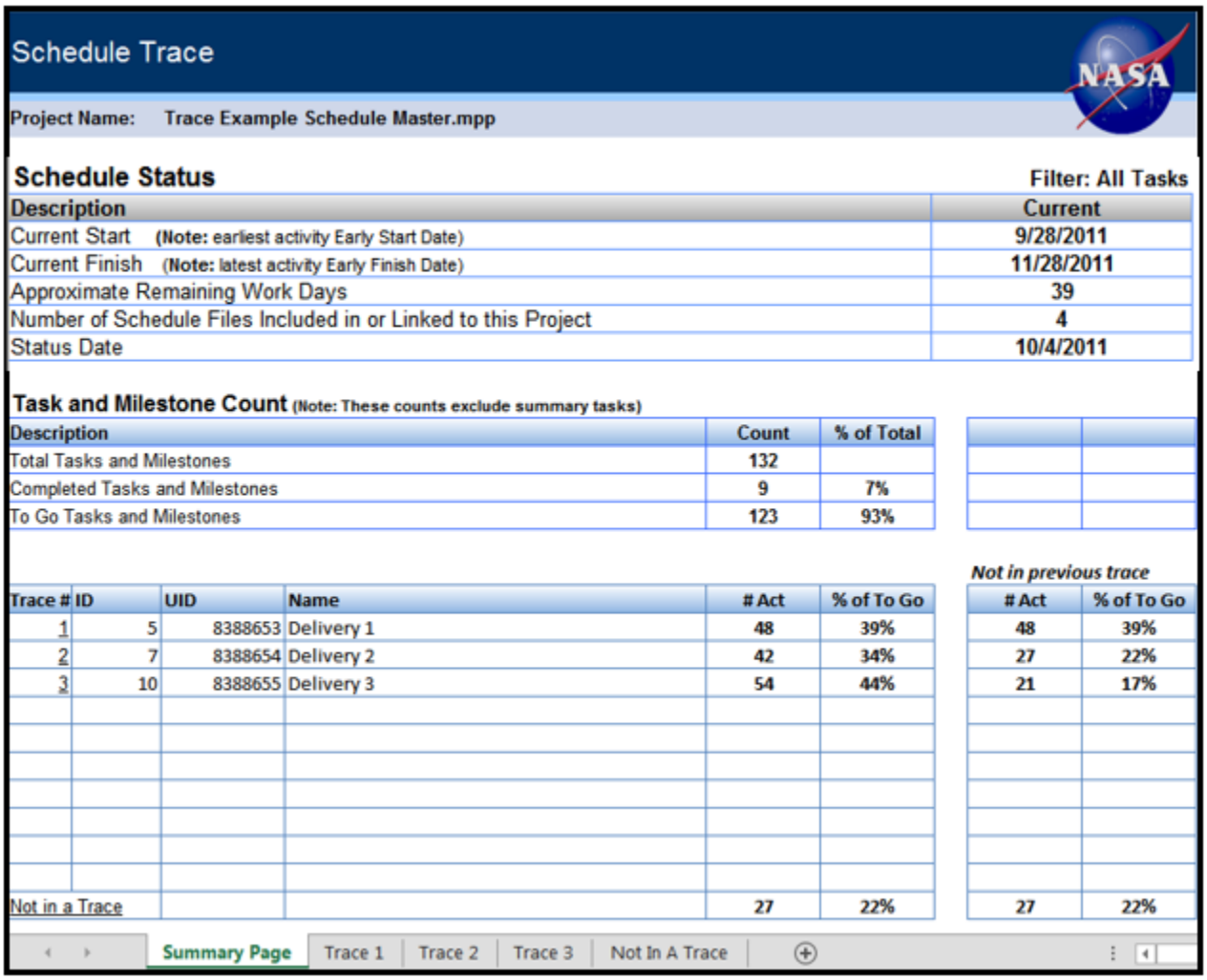


Figure 7-5: Schedule Trace Wizard Step 4

Understanding Schedule Trace Results

The schedule trace data provides the user with information on which activities are logically linked to the selected end activities, and which are not. This information can be useful in judging the credibility of the logic network. For example, if a subsystem that is required for assembly in the final delivered product is not logically linked to the final delivery then there is probably a problem with the logic. Also, in situations where the IMS contains multiple deliveries of common hardware, there should typically be a larger percentage of tasks needed (expected) for the first delivery due to the design effort only being required one time. This type of analysis of schedule network logic is especially helpful before a Schedule Risk Assessment or Joint Confidence Level analysis is performed. The following is an example of the schedule trace output.



Schedule Trace

Project Name: Trace Example Schedule Master.mpp

Schedule Status Filter: All Tasks

Description	Current
Current Start (Note: earliest activity Early Start Date)	9/28/2011
Current Finish (Note: latest activity Early Finish Date)	11/28/2011
Approximate Remaining Work Days	39
Number of Schedule Files Included in or Linked to this Project	4
Status Date	10/4/2011

Task and Milestone Count (Note: These counts exclude summary tasks)

Description	Count	% of Total
Total Tasks and Milestones	132	
Completed Tasks and Milestones	9	7%
To Go Tasks and Milestones	123	93%

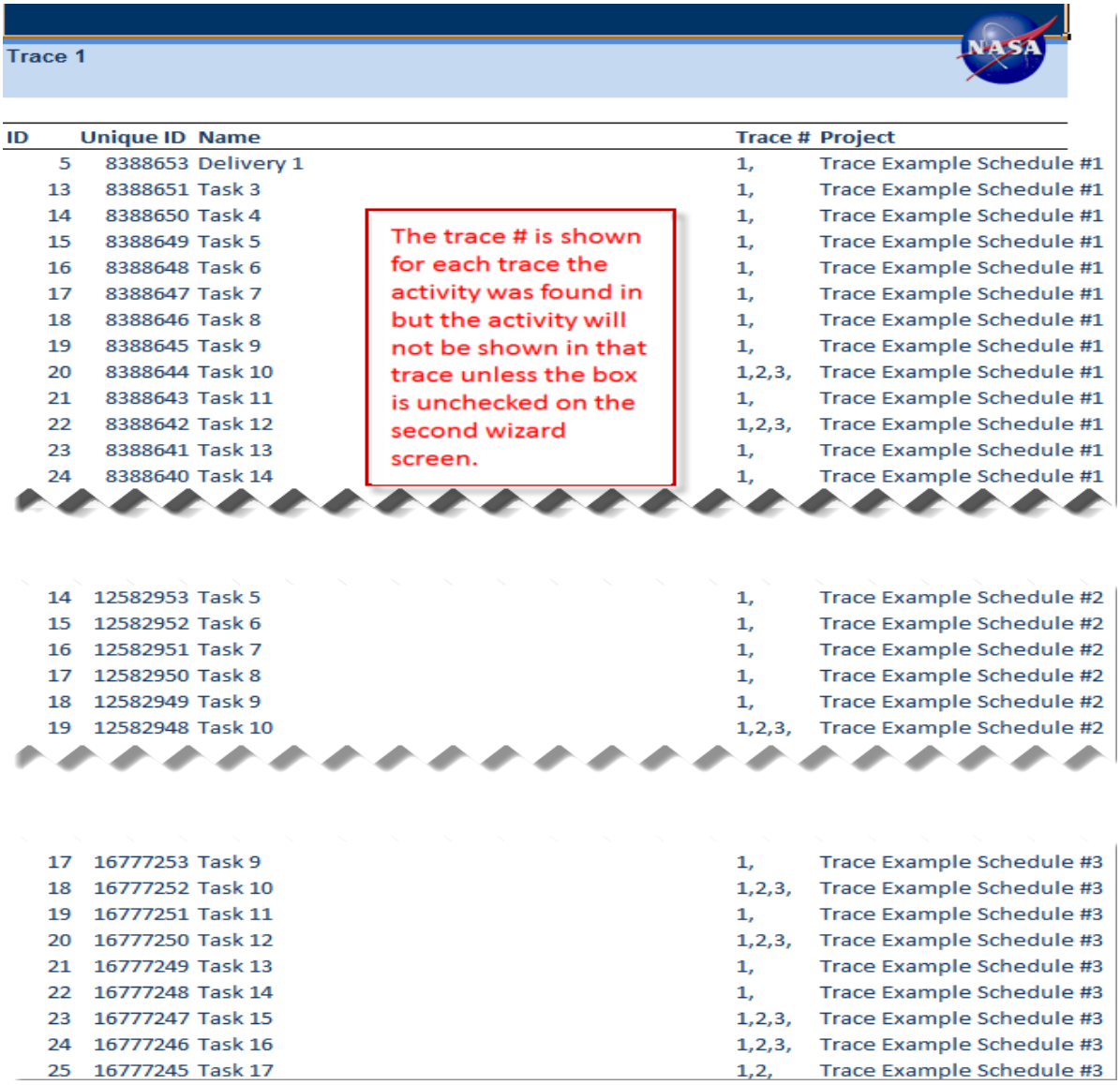
Trace #	ID	UID	Name	# Act	% of To Go	*Not in previous trace* # Act	*Not in previous trace* % of To Go
1	5	8388653	Delivery 1	48	39%	48	39%
2	7	8388654	Delivery 2	42	34%	27	22%
3	10	8388655	Delivery 3	54	44%	21	17%
Not in a Trace				27	22%	27	22%

Summary Page | Trace 1 | Trace 2 | Trace 3 | Not In A Trace

Figure 7-6: Schedule Trace Summary Page Output Example

The first two sections Schedule Status and Task and Milestone Count are the same as it the Health Check output and gives basic information about the schedule (See Figure 7-6). The To-Go Tasks and Milestones count is used to calculate the percentages in the trace results. The bottom section

gives the data for the traces performed in this run. After entering the ID or UID for each endpoint to be traced, the STAT tool will provide a trace identifying number and the task name for the endpoints selected. The next columns show the total quantity of to-go tasks and milestones that are linked to each end activity selected and also what percentage of the to-go tasks that is. The last line of the report shows the count of the tasks and milestones that are not in one of the listed traces. The last two columns of data gives the count of tasks that are in the trace and are not in a previous trace along with what percent that is of the to go tasks and milestones. Along the bottom of the report there will be tabs that contain a listing of the tasks that make up the counts in each trace and the ones that are not in any trace. Figure 7-7 is an example of the trace tab output.



ID	Unique ID	Name	Trace #	Project
5	8388653	Delivery 1	1,	Trace Example Schedule #1
13	8388651	Task 3	1,	Trace Example Schedule #1
14	8388650	Task 4	1,	Trace Example Schedule #1
15	8388649	Task 5	1,	Trace Example Schedule #1
16	8388648	Task 6	1,	Trace Example Schedule #1
17	8388647	Task 7	1,	Trace Example Schedule #1
18	8388646	Task 8	1,	Trace Example Schedule #1
19	8388645	Task 9	1,	Trace Example Schedule #1
20	8388644	Task 10	1,2,3,	Trace Example Schedule #1
21	8388643	Task 11	1,	Trace Example Schedule #1
22	8388642	Task 12	1,2,3,	Trace Example Schedule #1
23	8388641	Task 13	1,	Trace Example Schedule #1
24	8388640	Task 14	1,	Trace Example Schedule #1
14	12582953	Task 5	1,	Trace Example Schedule #2
15	12582952	Task 6	1,	Trace Example Schedule #2
16	12582951	Task 7	1,	Trace Example Schedule #2
17	12582950	Task 8	1,	Trace Example Schedule #2
18	12582949	Task 9	1,	Trace Example Schedule #2
19	12582948	Task 10	1,2,3,	Trace Example Schedule #2
17	16777253	Task 9	1,	Trace Example Schedule #3
18	16777252	Task 10	1,2,3,	Trace Example Schedule #3
19	16777251	Task 11	1,	Trace Example Schedule #3
20	16777250	Task 12	1,2,3,	Trace Example Schedule #3
21	16777249	Task 13	1,	Trace Example Schedule #3
22	16777248	Task 14	1,	Trace Example Schedule #3
23	16777247	Task 15	1,2,3,	Trace Example Schedule #3
24	16777246	Task 16	1,2,3,	Trace Example Schedule #3
25	16777245	Task 17	1,2,	Trace Example Schedule #3

Figure 7-7: Schedule Trace Output Trace Tab Example

Section 8: Margin Tracker

Initiating Margin Tracker:

The purpose of the Margin Tracker module is to provide the user a quick way to assessment how schedule margin is being managed within the project IMS. It is a recommended practice that schedule margin, based on risks, duration uncertainty, and historical norms, be clearly identifiable when included within the IMS. Schedule margin may also be referred to as "schedule reserve" or "schedule contingency." Schedule margin is typically owned and controlled by the Program/Project Manager. For clarification, it should be understood that schedule float (slack), which is a calculated value based on network logic, should not be considered as schedule margin. Schedule margin is a separately planned quantity of time above the planned duration estimate and reflected in the IMS. Schedule margin is used to cover uncertainty for situations that are difficult to predict, and is intended to reduce the impact of missing the overall planned schedule timeframe. The Margin Tracker will use the monthly margin task ID/UID inputs by the user and calculate a sum total of those durations to reflect a tally of the remaining schedule margin that exists within the project IMS. If additional days of schedule margin should also be included that are not represented by specific margin tasks then those values may also be added into the overall remaining total.

To initiate this assessment function, select the Margin Tracker icon from the MS Project toolbar (see Figure 8-1). This icon will initiate the Margin Tracker Wizard.

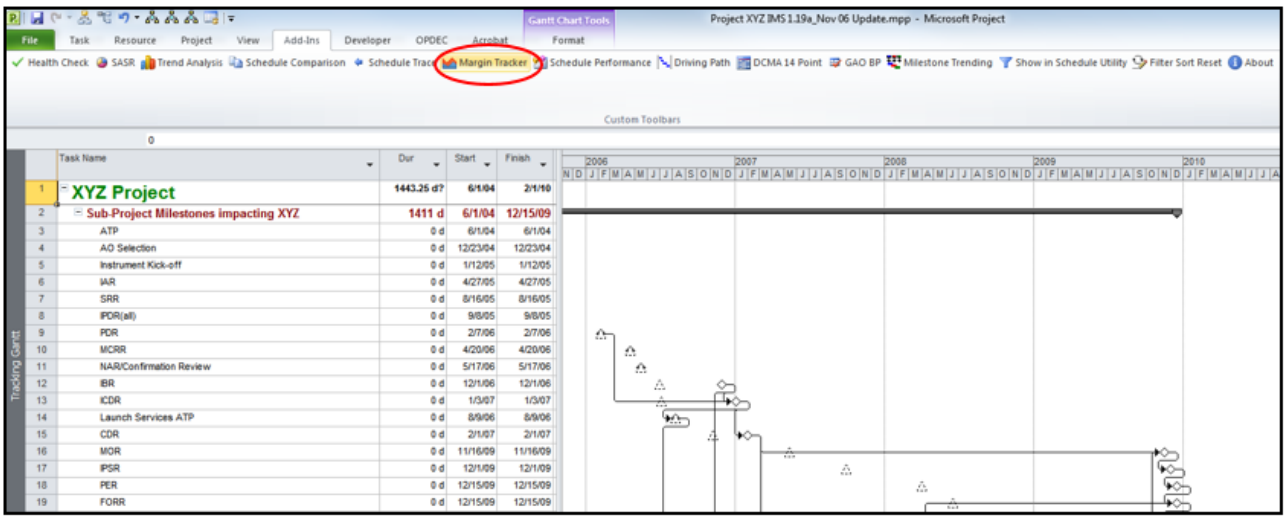


Figure 8-1: Margin Tracker Icon Toolbar Selection

Step 1 produces a wizard dialogue box (see Figure 8-2) that allows the user to set the schedule "Status Date" on which the resulting Margin Tracker results will be based. After selecting the desired status date click "Next". *Note: The schedule should have a Status Date that represents the "as-of" date which the schedule was updated through*. If the date is missing or obviously incorrect it should be added/changed.

Select “Next” to proceed to step two of the wizard.

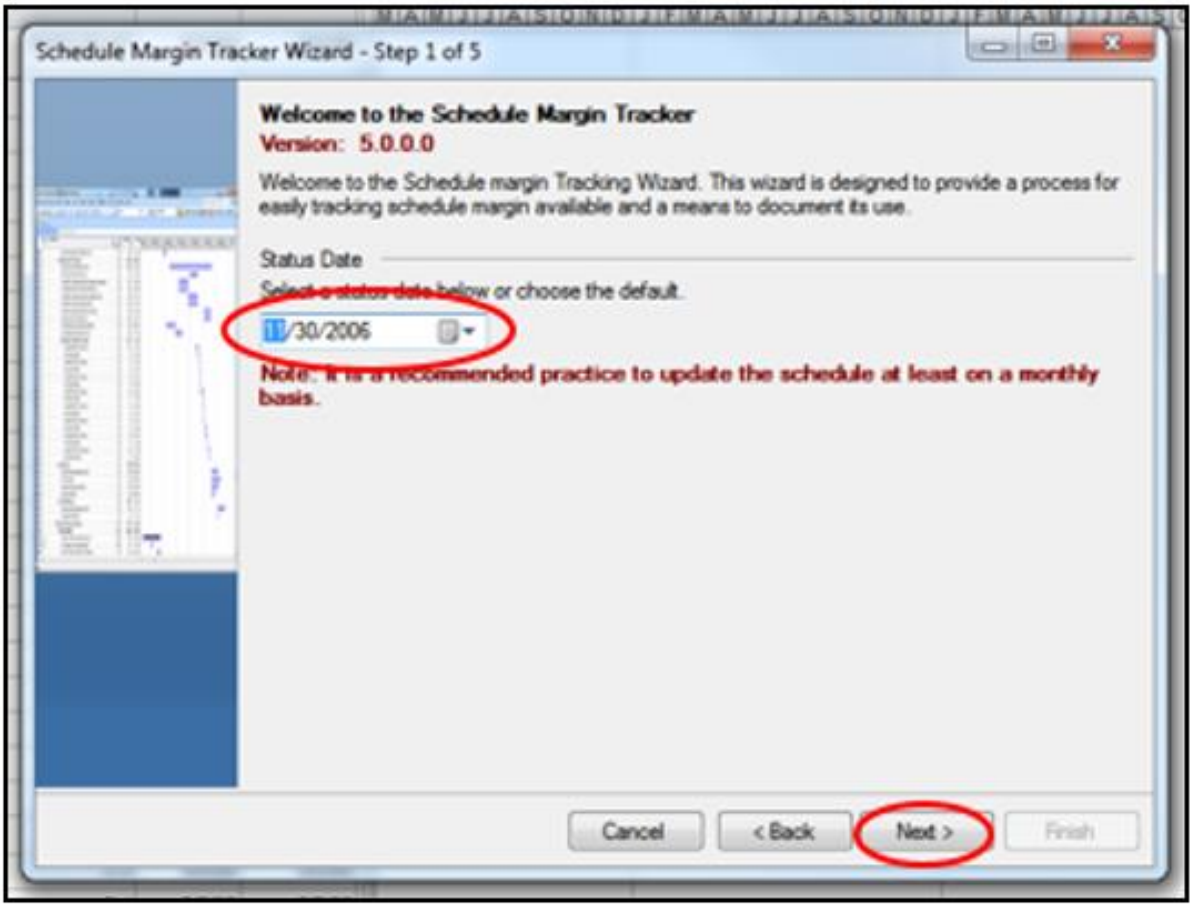


Figure 8-2: Margin Tracker Wizard Step 1

Step 2 of the Margin Tracker wizard produces a dialogue box that provides the user with selections needed for creating and storing the initial margin report, or updating a previous report that already exists. When creating the first Margin Tracker report for an IMS assessment, or no prior report exists to be updated, select “No” as the response to the first wizard question (see figure 8-3). When a previous margin report does exist, and the user wishes to update that report with the new month’s remaining schedule margin data, then select “Yes” and browse to locate and choose the correct report file to be updated (see figure 8-3).

The step 2 dialogue box also provides a browse function to allow the user to select the desired location where resulting Schedule Margin Tracking output report will be stored.

The filter selection allows the user to use the currently set filters or use no filters. Use No Filters is the default setting and will remove all filters and analyze the complete schedule. If the Use Current Filters is selected the filter that is set in the schedule and any Auto Filters will remain in effect and only the selected portion of the schedule will be analyzed.

After selecting the desired step 4 choices, click “Next”.

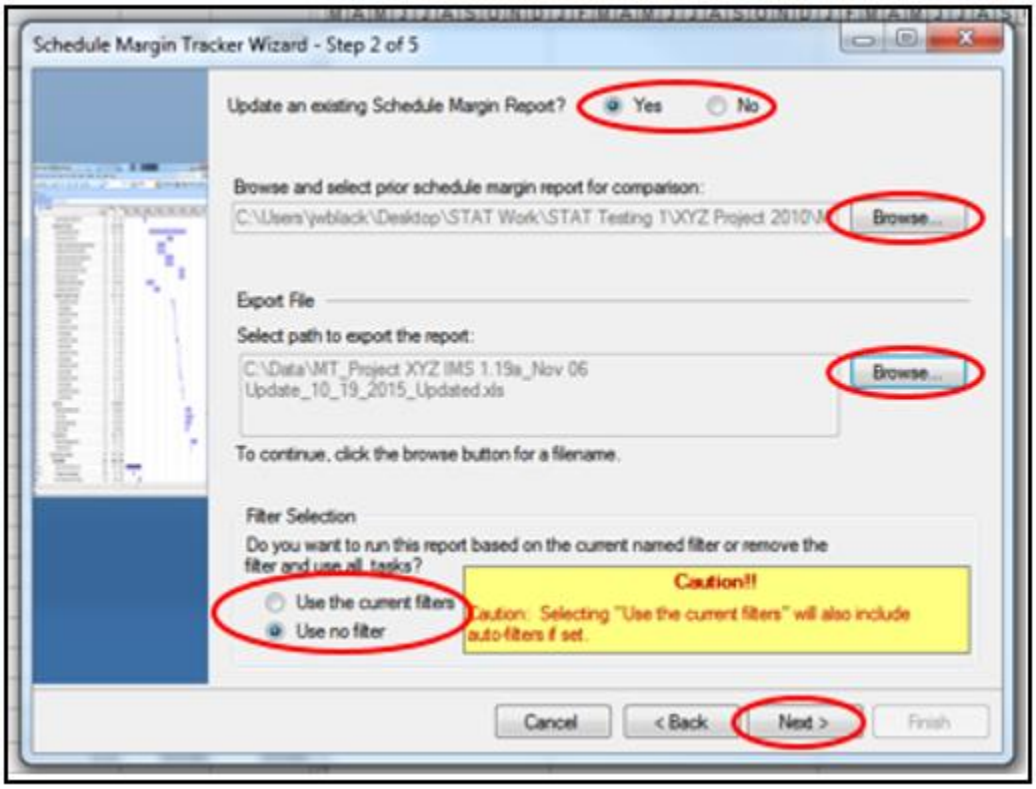


Figure 8-3: Margin Tracker Wizard Step 2

Step 3 produces a wizard dialogue box (see Figure 8-4) that is *only* needed if the user wants to enter manually known schedule margin contained in the current or a prior version of the project IMS, but was not reflected in a clearly identifiable schedule margin task. Simply select the appropriate month or months the known schedule margin existed and also enter the number of margin (reserve) days that are known to have existed during that month and then select "Add". The month and margin days will then be listed in the open pane below. Multiple months can be addressed, but must be selected one month at a time. If a mistake is made during the entry or a change is desired before proceeding to the next step then highlight in the listing the data to be changed and select "Remove". The correct information can then be entered

If all schedule margin is contained in clearly identifiable tasks within the IMS, then no manual margin entries are needed, and this step will not require any user input.

Click "Next" to continue.

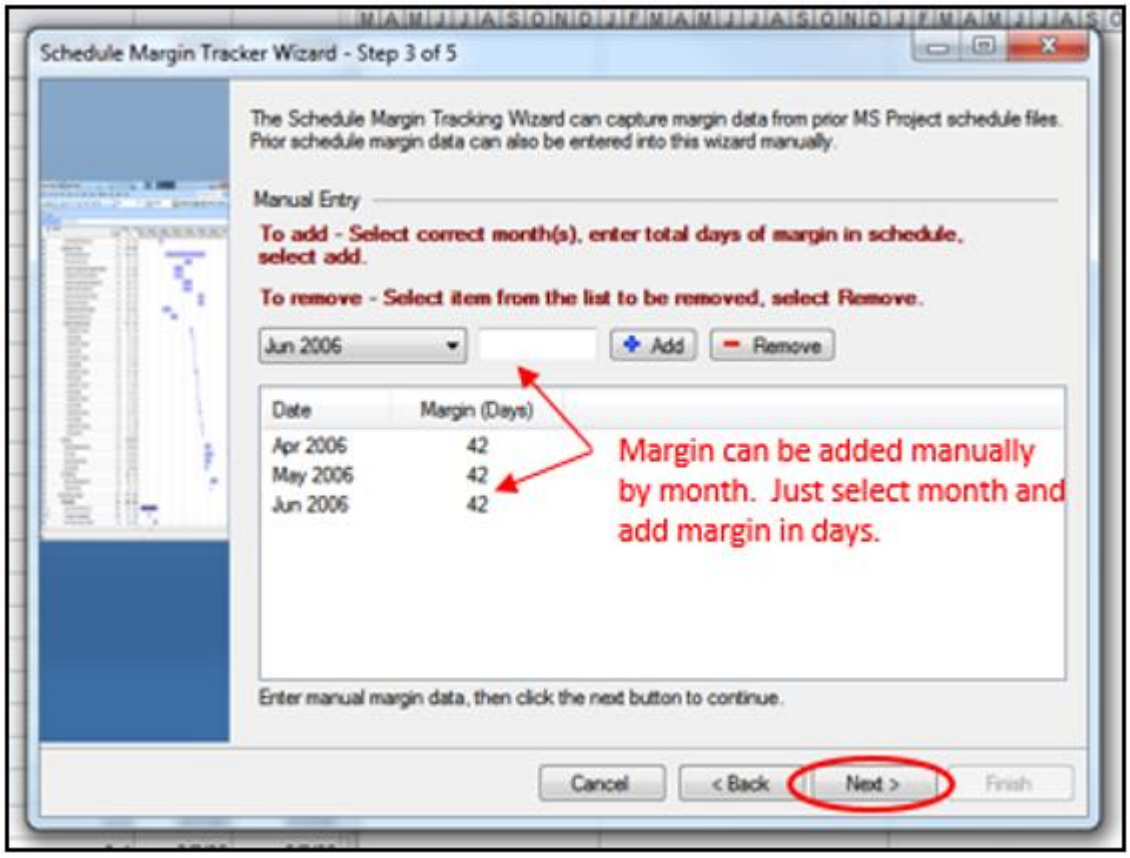


Figure 8-4: Margin Tracker Wizard Step 3

Step 4 produces a wizard dialogue box (see Figure 8-5) that allows the user to input the ID or UID numbers for clearly identifiable schedule margin tasks that are contained in the current version of the project IMS that is being assessed. First select ID or UID which is, of course, dependent upon the set of task identifiers the user will be entering. The user will then enter the specific task identifier and select "Add" after each entry. The ID# or UID# along with each task description will be listed in the open pane below. If a mistake is made during the entry or a change is desired before proceeding to the next step then highlight in the listing the data to be changed and select "Remove", the correct information can then be entered.

After all schedule margin (reserve) tasks are entered then select "Next" and proceed to the next wizard step.

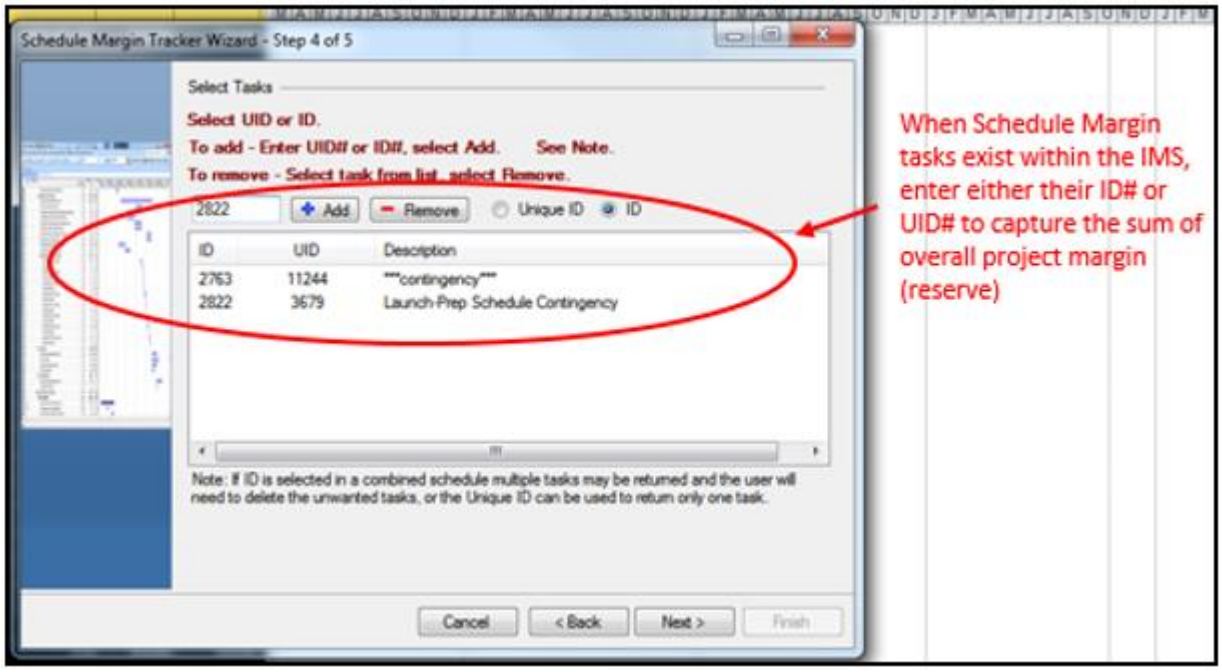


Figure 8-5: Margin Tracker Wizard Step 4

Step 5 of the Schedule Margin Tracker wizard produces a final dialogue box (See Figure 8-6) that allows the user to complete the final step in initiating the desired comparison output report. This dialogue box informs the user that Microsoft Excel 2000 or later must be installed. The user is also informed that the processing time for transferring the data results into the Excel template may take several minutes if the schedule file size is very large.

Click "Finish" to allow the Margin Tracker to complete the necessary processing and compilation of margin data. The STAT tool will then produce the desired tracking output report within excel to be used by the management team in their oversight and control of project schedule margin.

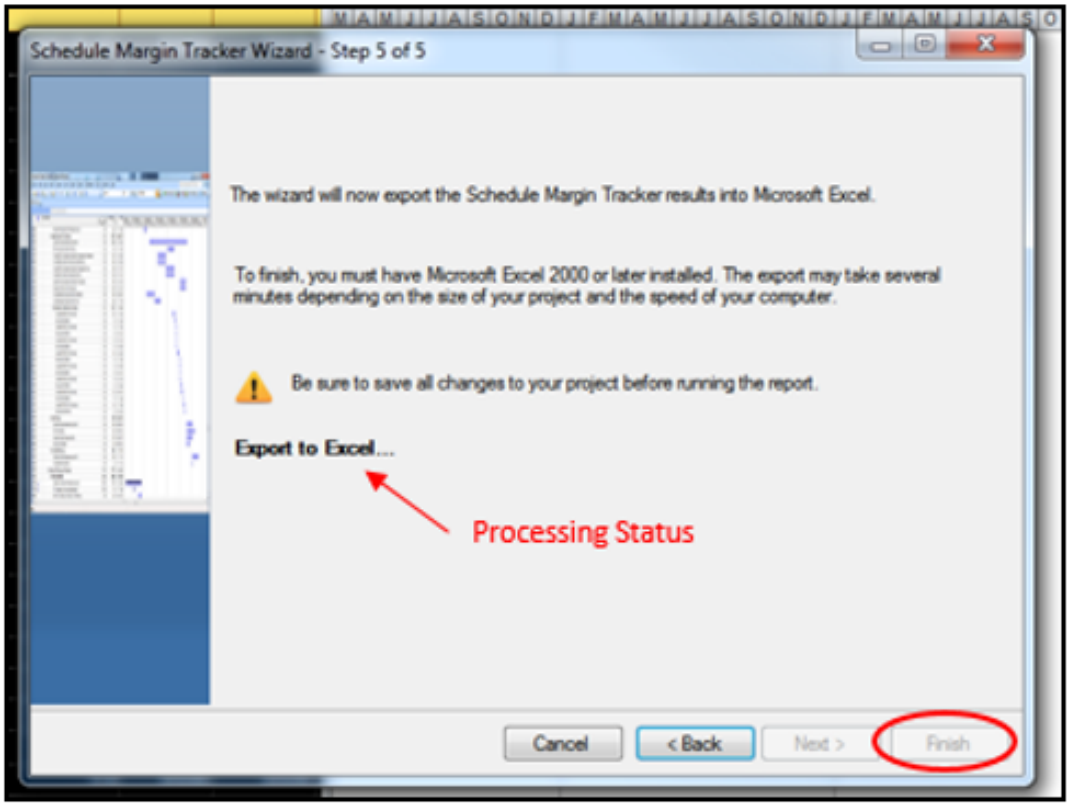


Figure 8-6: Margin Tracker Wizard Step 5

Understanding Schedule Margin Tracking Results

In the normal routine rhythm of project schedule updates and maintenance, there will potentially be problems that occur which require changes/updates to be incorporated into the IMS that have a negative impact on the quantity of existing project schedule margin (reserve) being carried in the project master schedule. Since project managers are the real owners of schedule margin and since the reason for having schedule margin is to buffer the project from impacts of harmful unknown risks, then it only makes sense to closely monitor and control the quantity and use of existing schedule margin contained in the project IMS. Shown below in Figure 8-7, the Schedule Margin Tracking Report provides a monthly snapshot of past and current quantities of remaining schedule margin. It also provides the capability to document the on-going usage of schedule margin which can only help the schedule management process be more effective in enabling projects to achieve success in meeting their cost, schedule, and technical goals. The Planned Burn-Down line is generated on the first run of the module. It is entered as a straight line between the first month and the last month of the project but can be edited in the data tab to fit the plan for the specific schedule. When the previous Excel file is opened the data for the Burn-Down line and past months data points will be copied to the new file.

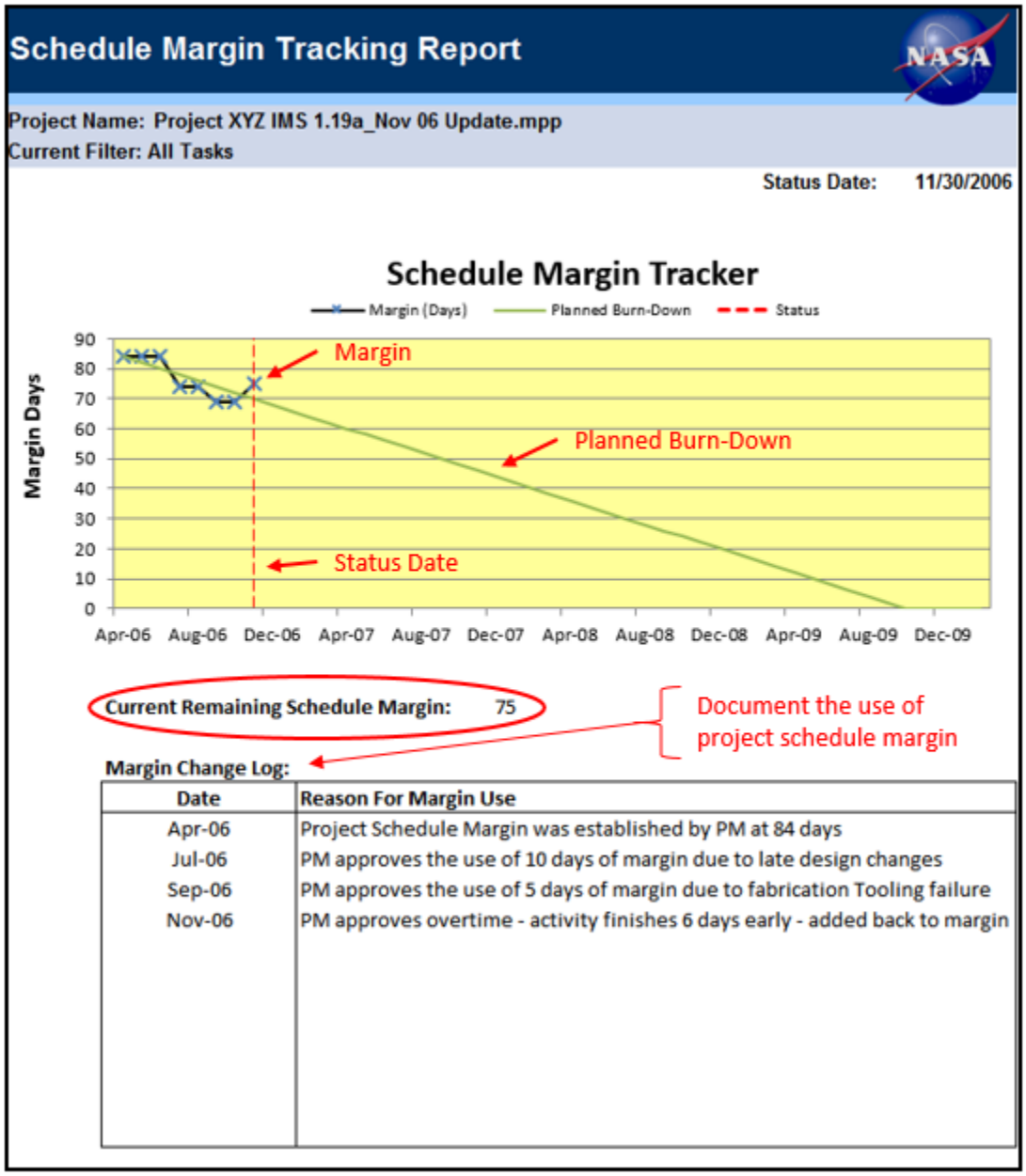


Figure 8-7: Margin Tracking Report with Usage Log

Section 9: Schedule Performance

Initiating the Schedule Performance Report

The purpose of the Schedule Performance module is to provide the user with a reporting tool that reflects strictly schedule performance information. In an effort for STAT to produce various effective formats for assessment reporting, it was decided that different reports were needed that dealt separately with schedule structure/integrity and execution performance. With that approach in mind, the Schedule Health Check (version 5.0) was restructured to only address schedule integrity indicators

and the Schedule Performance module was established to reflect only performance metrics. Much like the SASR output report, this module provides multiple types of graphical metrics to assist the user in making correct project judgments for management decision making that are based on accurate performance analysis.

To initiate this analysis function, select the Schedule Performance icon (see Figure 9-1) from the MS Project toolbar. *Note: If using Microsoft Project 2010 or 2013, the Schedule Performance icon will be listed under the "Add-Ins" tab on the toolbar.* This icon initiates the automated wizard to lead the user through five simple steps to produce a Schedule Performance output report.

Figure 9-1: Initiate Schedule Performance Module

Step 1 produces a wizard dialogue box (see Figure 9-2) that allows the user to set the schedule "Status Date" on which the resulting assessment and analyses data will be based. Generally the status date will already be set within the project schedule file, but if not, STAT will alert the user to set the correct date within this wizard. This dialogue box also allows the user to select the correct baseline version to be used in calculating the various assessment metrics addressed within the Schedule Performance module. If no specific baseline is selected, the default version will be set on "Baseline".

After selecting the desired Status Date and correct baseline version, then click "Next".

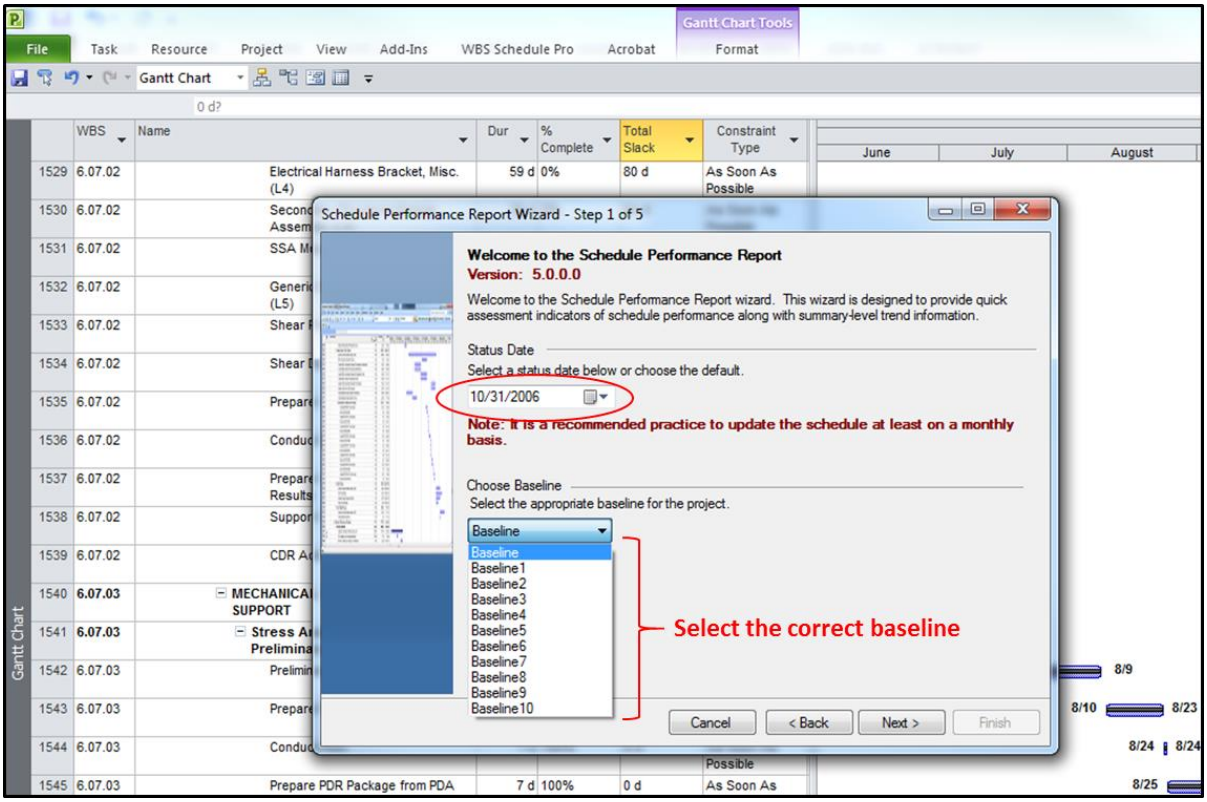


Figure 9-2: Schedule Performance Wizard Step 1

Step 2 produces a wizard dialogue box (see Figure 4-2) that allows the user to indicate whether or not to calculate the monthly "Hit or Miss" value. This calculation reflects a performance index of how many tasks and milestones that were baselined to complete during the current month actually were completed. If the "Hit or Miss" option is selected then the value will be plotted along with the Baseline Execution Index (BEI) on the output report. If it is not selected then the output report will only show the BEI metric.

The filter selection allows the user to keep filters that are already set in the IMS or use no filters when running this module. "Use No Filters" is the default setting and will remove all filters that may be set before analyzing the complete schedule. *Note, if "Use Current Filters" is selected, then the user defined filter that is already set along with any auto filters will remain in effect and only the selected portion of the schedule will be analyzed.*

After completing the desired step 2 choices, click next.

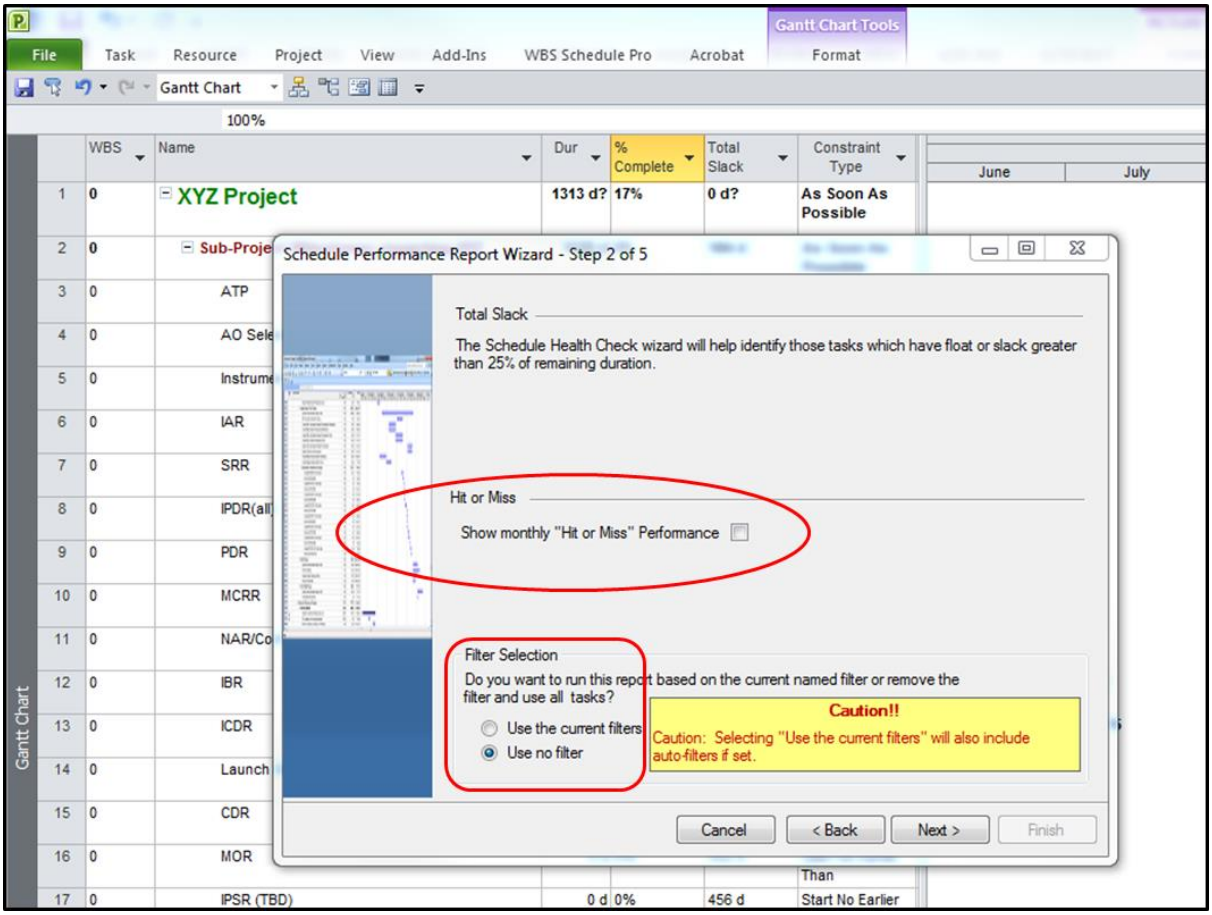


Figure 9-3: Schedule Performance Wizard Step 2

Step 3 produces a wizard dialogue box (see figure 9-4) that allows the user to include the Current Execution Index (CEI) metric as part of the Schedule Performance output report. If the user chooses to include the CEI then they will be required to browse and select a previous version of the same schedule to enable STAT to gather the forecasted task start/finish dates that were projected for the period just completed. This information is needed to complete the CEI calculation. This report also provides the user with the option to reflect the new CEI result as part of a continuing graphic which displays previous period results. If this is desired then the wizard allows the user to browse and select a previous report where the new result will be added. After CEI setup choices are completed the user will then select next.

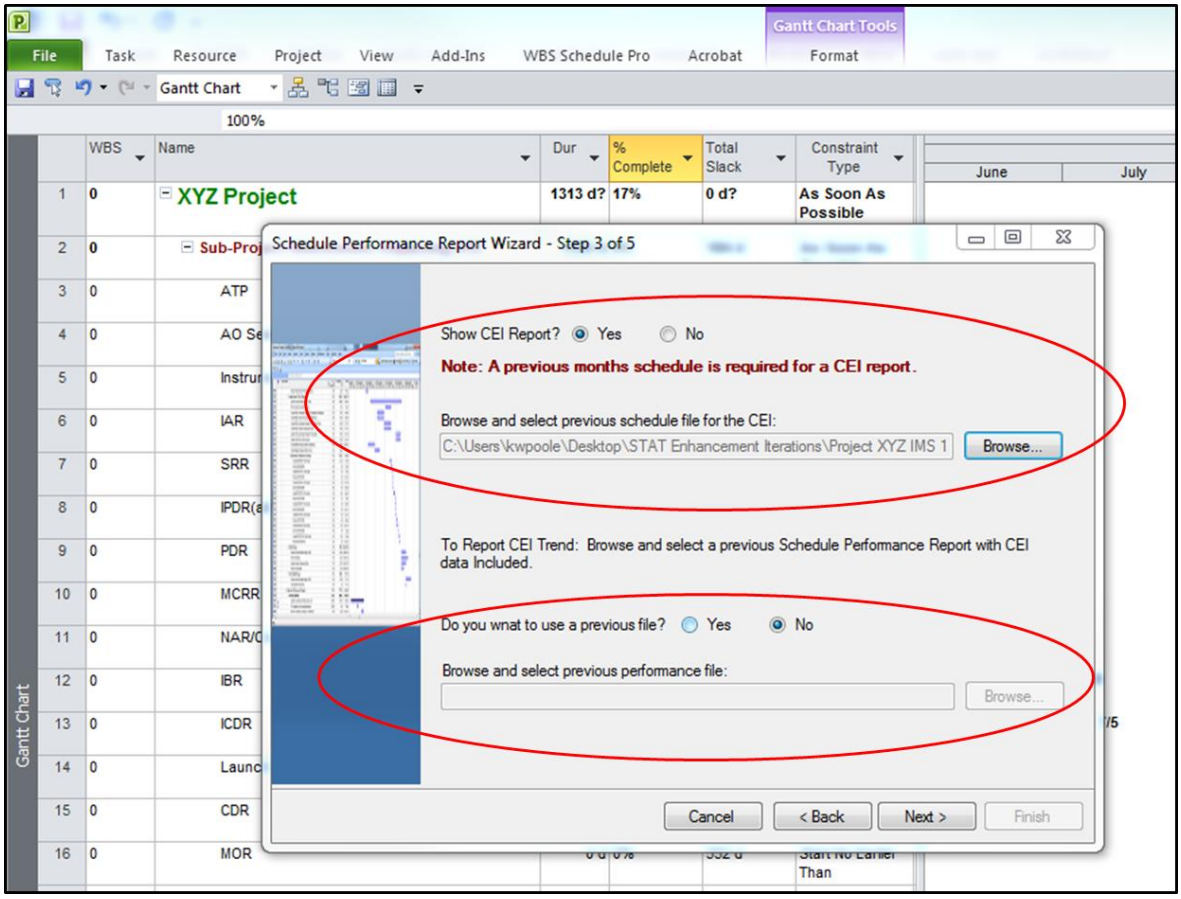


Figure 9-4: Schedule Performance Wizard Step 3

Step 4 produces a wizard dialogue box that allows the user to select key milestones to monitor variances from the approved baseline dates. The Schedule Performance output report provides a comparison graphic that highlights the amount of variance from baseline dates for only those milestones that are selected in this dialogue box. This dialogue box provides two options for identifying the desired milestones to be assessed in the output report. Option one is to select "All Milestones" from the drop down listing. This choice provides a listing of every milestone contained in the full schedule from which the user can scroll through and individually pick the milestones to be assessed. If the user selected within step 2 of the wizard to use the current filter then only the milestones within that filter will be available to select from. *Note, when option one is used the user must remember to hold down the control key while making the individual milestone selections.* Option two (see figure 9-5) is to select a pre-defined filter previously established which will automatically select the desired set of milestones from the IMS to be assessed and reflected in the output report. There is no limit on the number of milestones that may be selected for any single report run.

The step 4 dialogue box also provides a browse function to allow the user to select the location where he wishes the final Schedule Performance output file to be stored.

After completing the desired step 3 choices, click next.

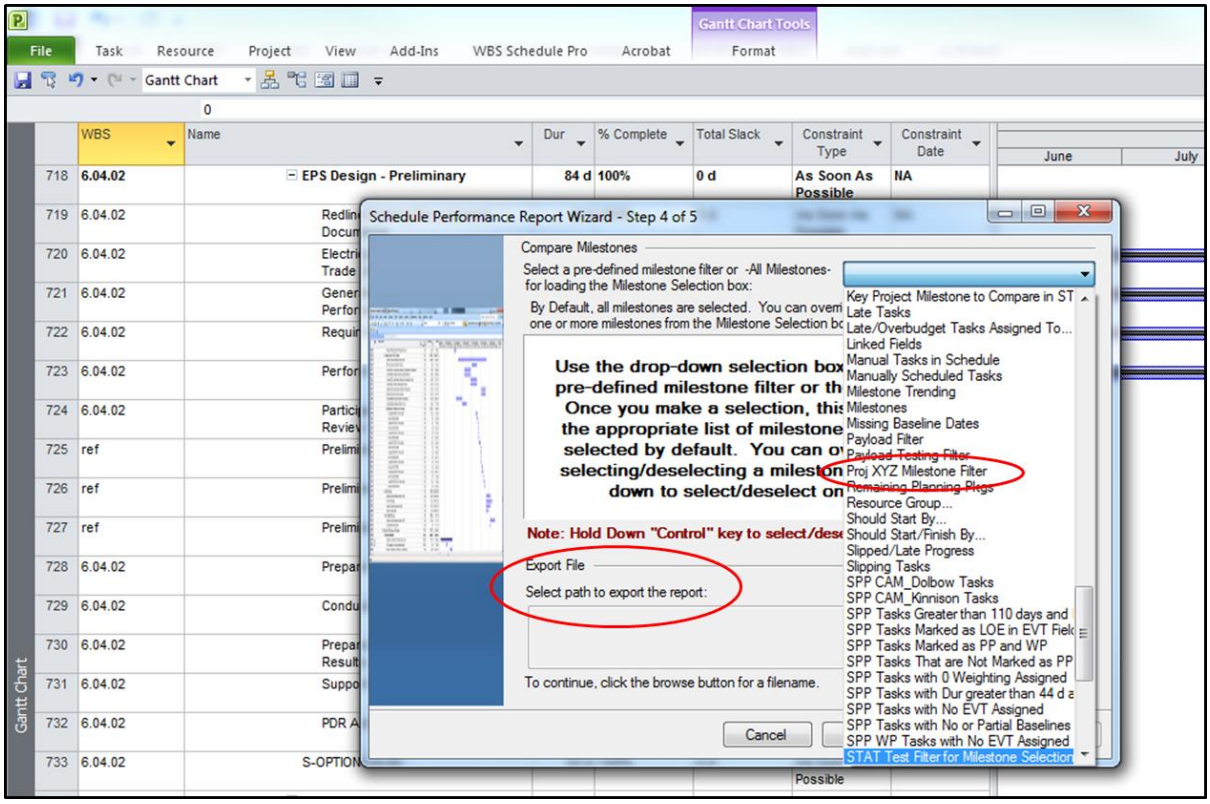


Figure 9-5: Schedule Performance Wizard Step 4

Step 5 of the Wizard produces a final dialogue box (see Figure 9-6) that allows the user to complete the final step in initiating the Schedule Performance analysis report. This dialogue box informs the user that Microsoft Excel 2000 or later must be installed. The user is also informed that the processing time for creating and transferring the performance data results into the Excel template may take several minutes if the schedule file size is very large. A processing status is also provided to keep the user informed on the status of the tool during its gathering and formatting of data from the schedule into the final output report.

Click finish to complete the Schedule Performance Report processing and compilation of assessment and performance data.

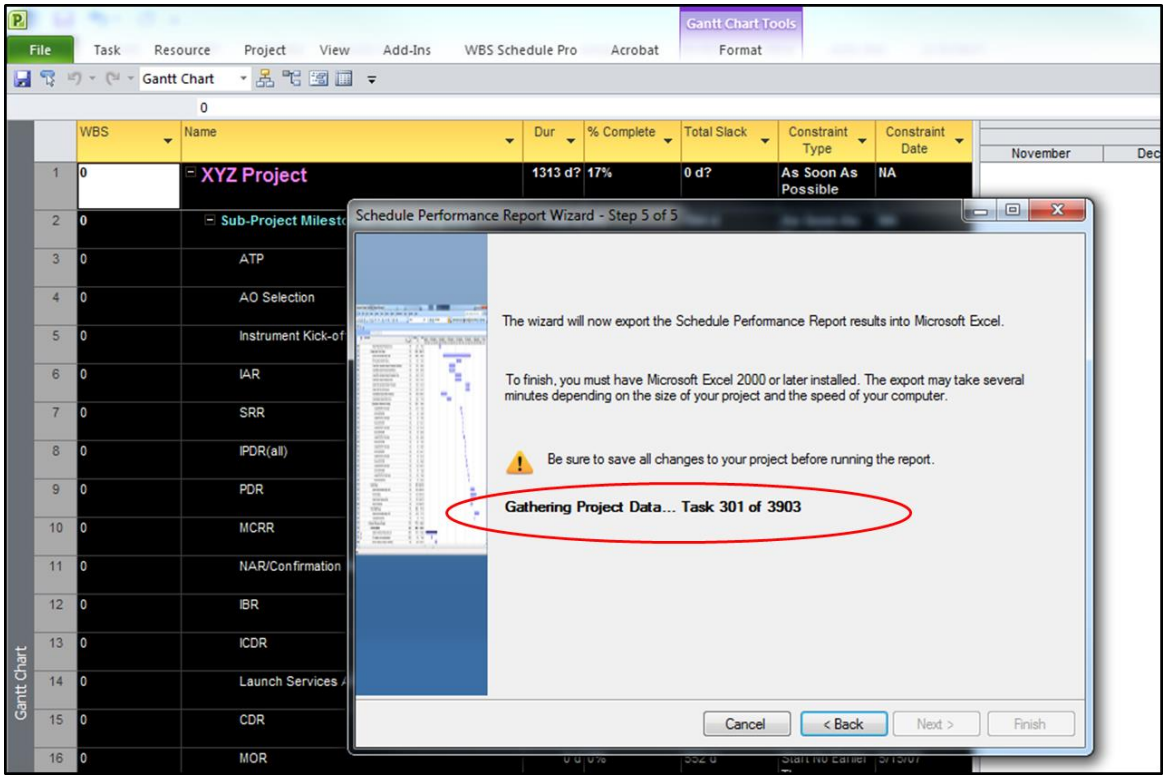


Figure 9-6: Schedule Performance Wizard Step 5

Understanding Schedule Performance Report Results:

The Schedule Performance contains five important metrics to help the user in making sound judgments when determining and analyzing project schedule performance. All of the metrics are reflected in user-friendly stoplight fashion. The stoplight ratings contained in this report are based on calculations per the designated criteria and threshold factors designed for each metric. The individual performance metrics are listed below. Please note that each of the performance metrics listed below are addressed earlier within the Schedule Performance Report module and explained fully with Section 4 of this document. See Section 4 for a detailed explanation and help in understanding and using each of the metrics below. *Note: Each of the graphics can be copied and pasted to PowerPoint or other applications but for best results past the graphic as a picture.*

- ***Schedule Performance Trend:*** This metric provides analysis insight based on performance trends relating to actual and projected task and milestone finishes.

- ***Baseline vs. Actual Finishes Analysis:*** This analysis graphic reflects actual schedule performance against the baseline plan.

- ***Baseline Execution Index (BEI) - includes Hit or Miss (HOM):*** This metric provides two different performance perspectives on how well a project is performing in completing the baseline plan. The primary metric provided in this graphic calculates a BEI value which

indicates to the user how well the project is following the baseline plan and completing baseline tasks as they are scheduled to be completed.

- ***Current Execution Index (CEI):*** This graphic displays schedule performance metrics that compare the number of actual schedule task completions to the total number of tasks that were forecasted to complete during the reporting period.

- ***Schedule Milestone Comparison:*** This performance metric provides a basic status comparison for all selected milestone dates from the project schedule. The comparison reflects the baseline dates versus the current dates for the selected project milestones. The amount of schedule variance is also shown where the baseline and current schedules diverge.

As noted above a full explanation of each of the above metrics is provided in Section 4.

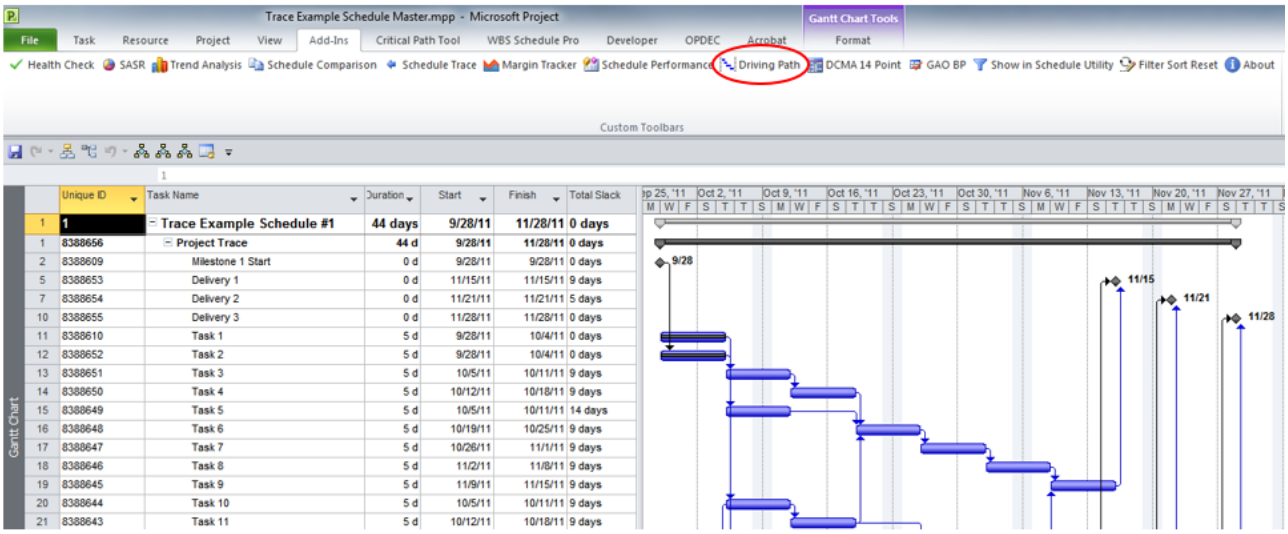
Section 10: Driving Path

Initiating Driving Path Module

The purpose of the Schedule Driving Path Module is to provide the user with a quick look at which activities are driving a selected task, based on the network logic. The module will look at each of the predecessors for the selected task and determine the task or tasks that are driving its dates. The module will follow the driving logic path back until there is no predecessors or the predecessor is complete. Multiple driving paths will be shown if they are equally driving and in cases where a constraint date is driving the task, a sub path of the most driving activity will be followed. It should also be noted, that when summary activity logic is present and on the driving path, it will be shown. The user should be advised to always make sure that the endpoint selected, from which the driving path is to be identified, is not an already completed task/milestone. If a completed endpoint is selected then no tasks can be identified for the driving path.

To initiate this module, select the Driving Path icon from the MS Project toolbar (see Figure 10-1).

Clicking on the icon initiates the Driving Path Wizard.



	Unique ID	Task Name	Duration	Start	Finish	Total Slack
1	1	Trace Example Schedule #1	44 days	9/28/11	11/28/11	0 days
1	8388656	Project Trace	44 d	9/28/11	11/28/11	0 days
2	8388609	Milestone 1 Start	0 d	9/28/11	9/28/11	0 days
5	8388653	Delivery 1	0 d	11/15/11	11/15/11	9 days
7	8388654	Delivery 2	0 d	11/21/11	11/21/11	5 days
10	8388655	Delivery 3	0 d	11/28/11	11/28/11	0 days
11	8388610	Task 1	5 d	9/28/11	10/4/11	0 days
12	8388652	Task 2	5 d	9/28/11	10/4/11	0 days
13	8388651	Task 3	5 d	10/5/11	10/11/11	9 days
14	8388650	Task 4	5 d	10/12/11	10/18/11	9 days
15	8388649	Task 5	5 d	10/5/11	10/11/11	14 days
16	8388648	Task 6	5 d	10/19/11	10/25/11	9 days
17	8388647	Task 7	5 d	10/26/11	11/1/11	9 days
18	8388646	Task 8	5 d	11/2/11	11/8/11	9 days
19	8388645	Task 9	5 d	11/9/11	11/15/11	9 days
20	8388644	Task 10	5 d	10/5/11	10/11/11	9 days
21	8388643	Task 11	5 d	10/12/11	10/18/11	9 days

Figure 10-1: Driving Path Tool Bar Selection

Step 1 of the Driving Path wizard dialogue box (Figure 10-2) allows the user to set the schedule "Status Date". *Note: The schedule should reflect a Status Date that represents the most current date for which the schedule has been progressed through.* If the date is missing or obviously incorrect it should be added or changed. Also this dialogue box will allow the user to select the Output Option. The user can select from the dropdown menu to see the results in Microsoft Project, Excel tabular output or both.

Click the Next box to proceed.

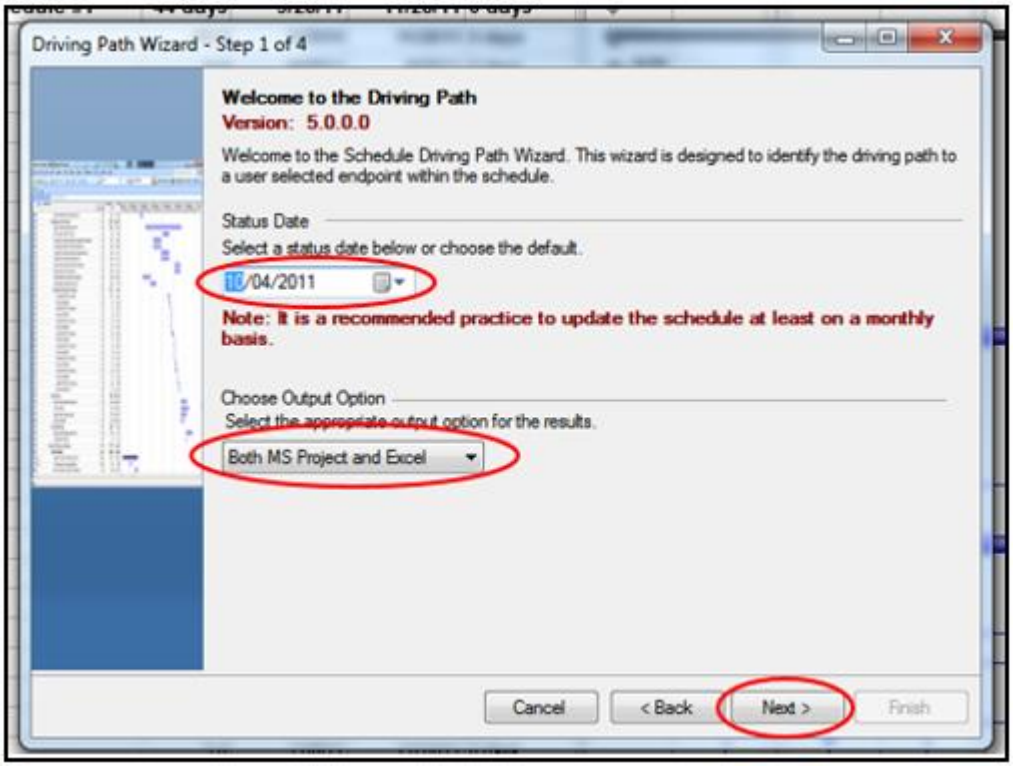


Figure 10-2: Driving Path Wizard Step 1

Step 2 of the Driving Path wizard dialogue box (Figure 10-3) provides a browse function to allow the user to select the location where they wish the Excel Driving Path output file to be stored, if that option is selected. The Driving Path marker is stored in a Number field, Number15 is the default but the user can change the Number field used by selecting another one from the dropdown menu box. Warning: If there is data in the selected field it will be overwritten. The filter selection allows the user to use the current filters that are set in MS Project or use no filters. Use No Filters is the default setting and will remove all filters and analyze the complete schedule. If the Use the Current Filters is selected the filter that is set in the schedule and any Auto Filters will remain in effect and only the selected portion of the schedule will be analyzed. Warning: When Use the Current Filters is selected and the driving path is traced to an activity that is filtered out, an error box will appear and wait for the user to acknowledge and that path will be ignored. The driving path will be traced through the most driving tasks that are in the filtered activities. This condition may cause an incorrect driving path to be identified.

Click the Next box to proceed.

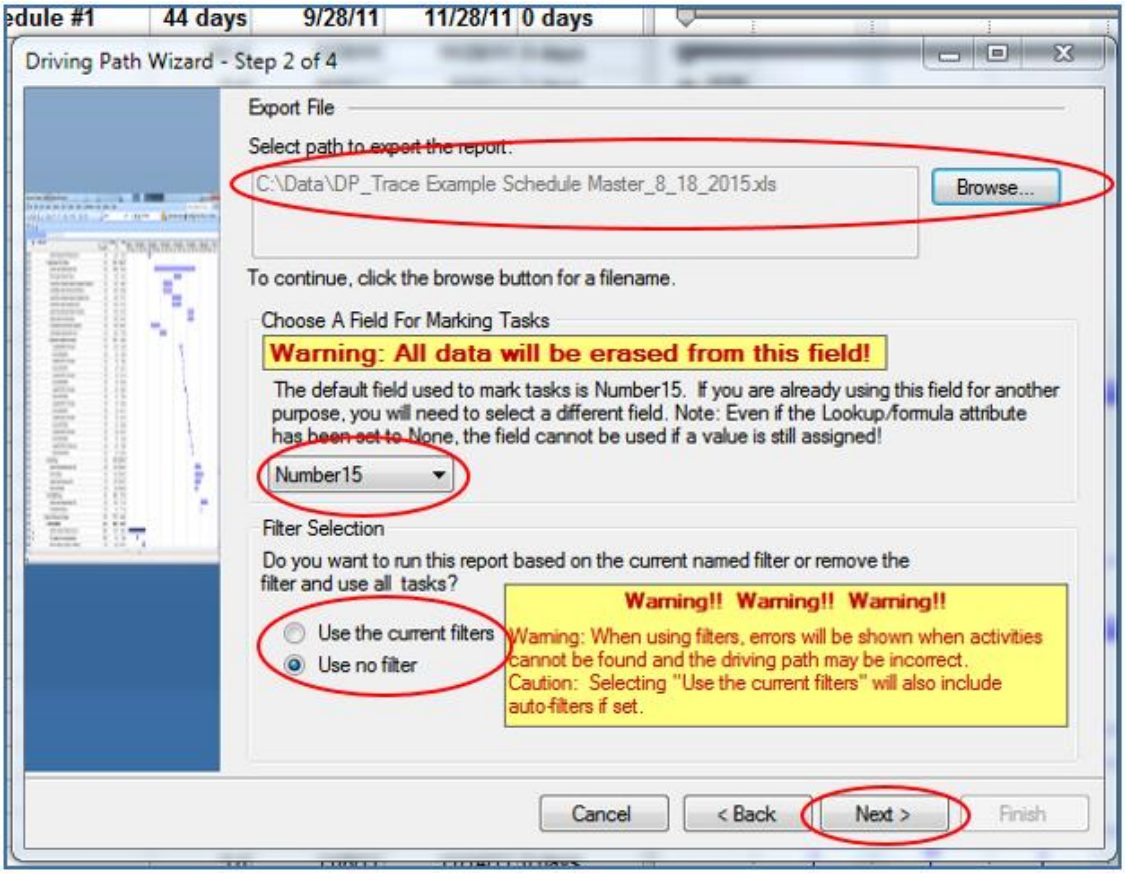


Figure 10-3: Driving Path Wizard Step 2

Step 3 of the Driving Path wizard dialogue box (Figure 10-4) allows the user to identify the activity the driving path is being determined for. Activities can be selected by ID or Unique ID by clicking on the radial buttons Unique ID or ID. Only one activity can be selected for the driving path to be determined. If the ID is used with a Master/Subproject schedule you may get multiple activates added to the list. If this occurs select the unwanted activities and click the Remove box.

Click the Next box to proceed.

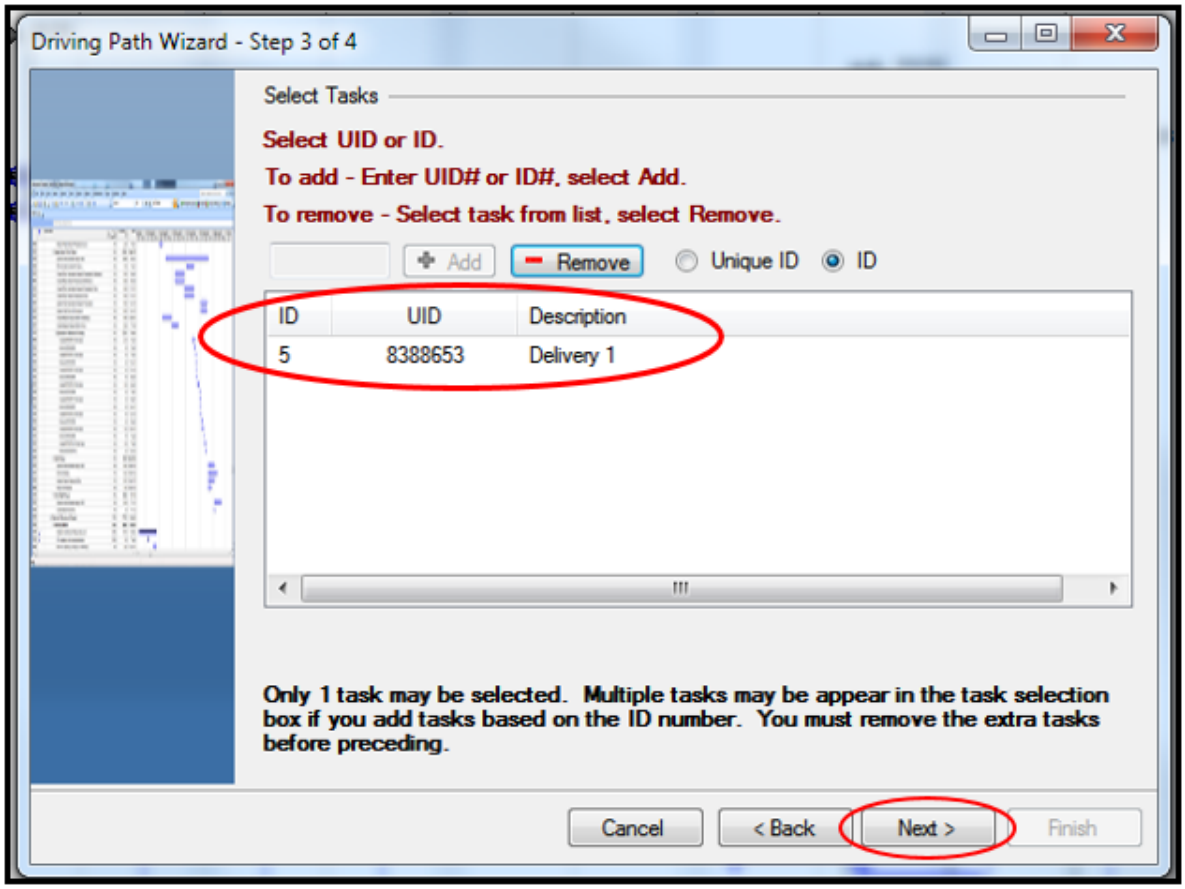


Figure 10-4: Driving Path Wizard Step 3

Step 4 of the Driving Path wizard dialogue box (Figure 10-5) provides the option to back up and make changes or click the Finish box to process the schedule data to produce the output in the selected formats. The user is also informed that the processing time for transferring the data results into the selected formats may take several minutes if the schedule file size is very large.

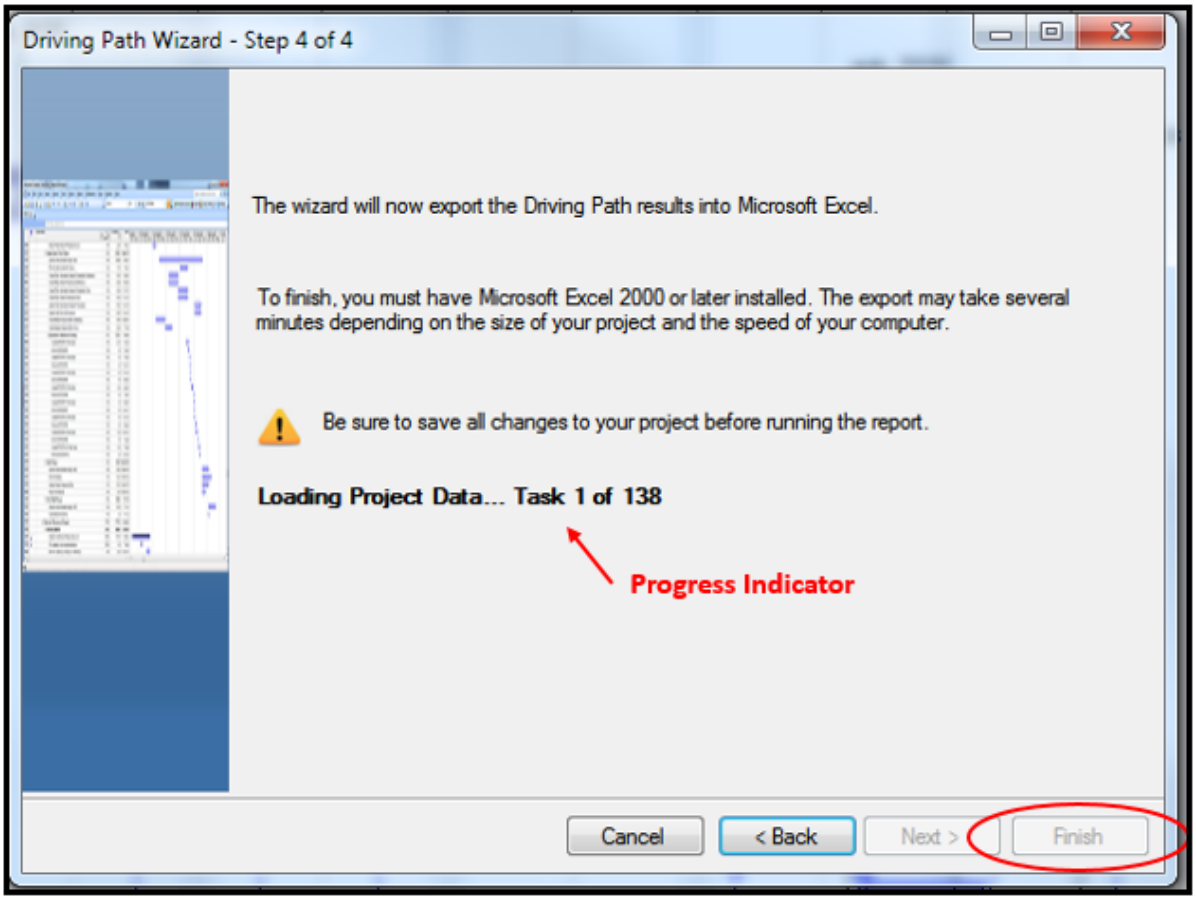


Figure 10-5: Driving Path Wizard Step 4

Understanding Driving Path Results

The driving path data provides the user with information on which activities are logically driving the selected end activity. The module looks at each of the predecessors for the selected task and determine the task or tasks that are driving its dates. The module then follows the driving logic path back until there is no predecessor or the predecessor is complete. If there are multiple predecessor activities that are equally driving a task then each path will be followed. If an activity in the path is being driven by a constraint date, then the module will look for the activity that would be driving if the constraint date was removed and continue to follow the path. A new driving path marker will be added to the chosen Number field and will be in the 100 range. The results are filtered to the driving activities and sorted by driving path marker, finish date, and start date. The driving path marker is stored in the selected number field and this should be added to the Microsoft project view to aid in the analysis of the output. Figure 10-6 is an example of the Driving Path output in Microsoft Project.

Note: The filtering and sorting can be removed from the schedule by using the Filter Sort Reset module. See Section 14.2 for instructions on using the Filter Sort Reset module.

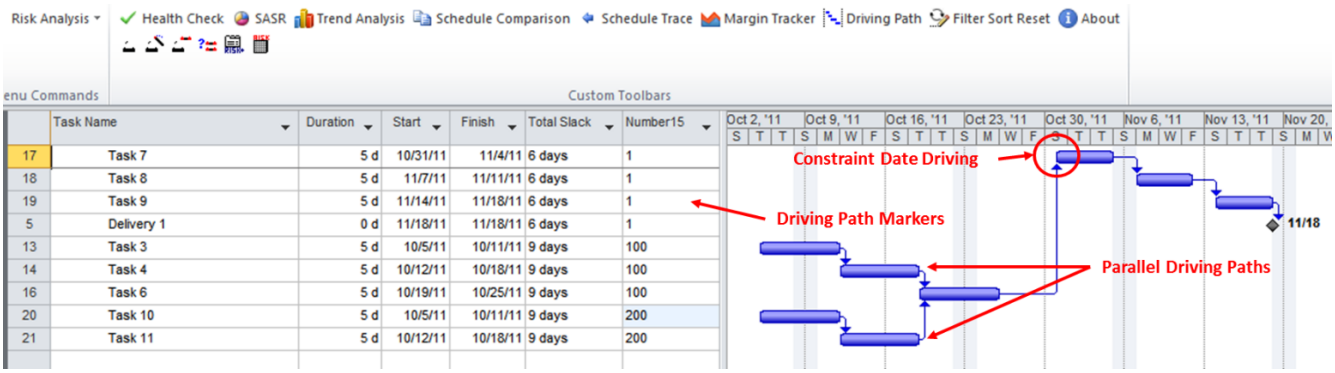


Figure 10-6: Driving Path Output Example Microsoft Project

A summary page is produced in Excel, (if that option is chosen) and a tab with the list of tasks that are driving the selected end point is provided. The first two sections (Schedule Status and Task and Milestone Count) are the same as in the Health Check output and give basic information about the schedule (See Figure 10-7). The To-Go Tasks and Milestones count is used to calculate the percentages in the results. The bottom section gives the number of activities in the driving path. Along the bottom of the report there will be tabs that contain a listing of the tasks that make up the count in the driving path. Figure 10-8 is an example of the Driving Path output tab.

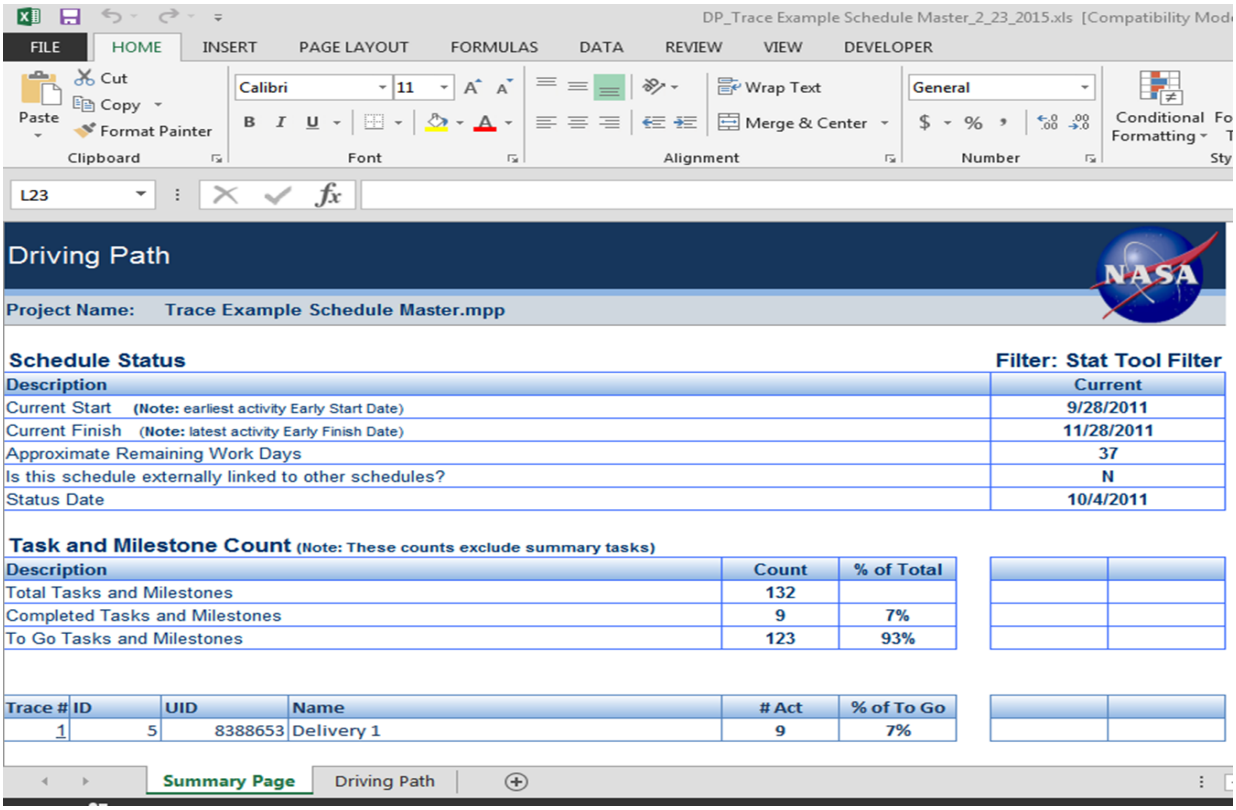
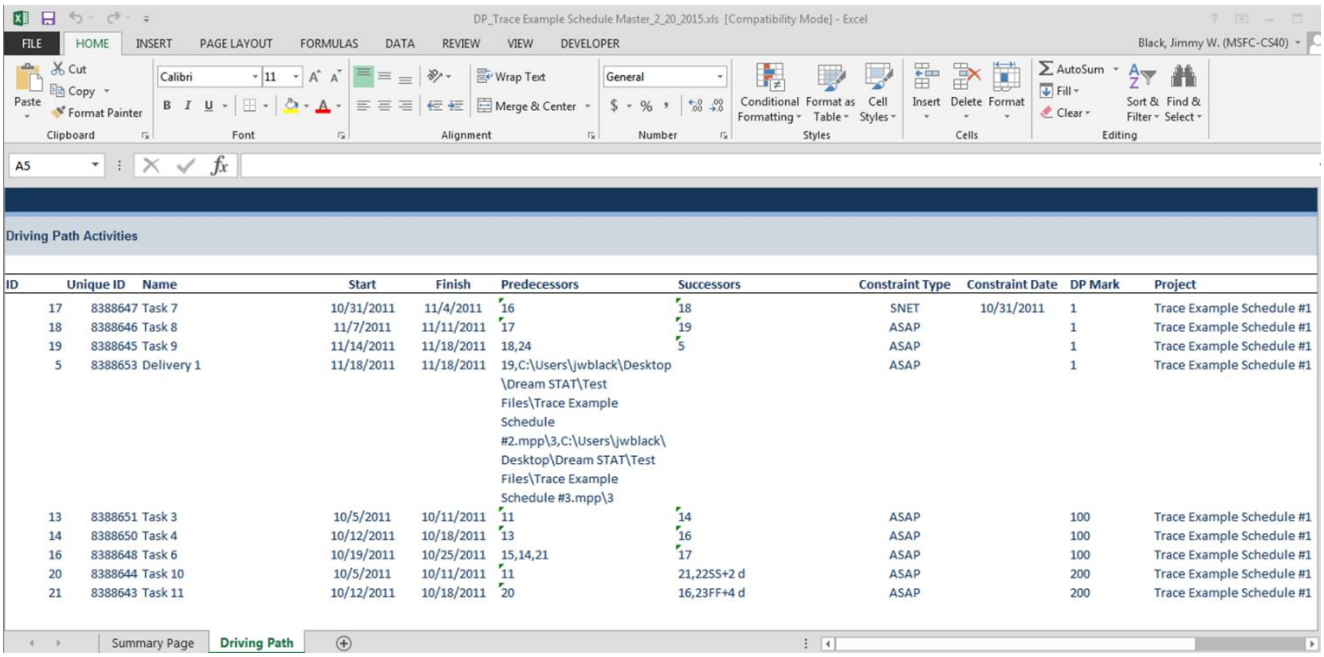


Figure 10-7: Driving Path Summary Page Excel Output Example



Driving Path Activities

ID	Unique ID	Name	Start	Finish	Predecessors	Successors	Constraint Type	Constraint Date	DP Mark	Project
17	8388647	Task 7	10/31/2011	11/4/2011	16	18	SNET	10/31/2011	1	Trace Example Schedule #1
18	8388646	Task 8	11/7/2011	11/11/2011	17	19	ASAP		1	Trace Example Schedule #1
19	8388645	Task 9	11/14/2011	11/18/2011	18,24	5	ASAP		1	Trace Example Schedule #1
5	8388653	Delivery 1	11/18/2011	11/18/2011	19,C:\Users\jwblack\Desktop\Dream STAT\Test Files\Trace Example Schedule #2.mpp\3,C:\Users\jwblack\Desktop\Dream STAT\Test Files\Trace Example Schedule #3.mpp\3		ASAP		1	Trace Example Schedule #1
13	8388651	Task 3	10/5/2011	10/11/2011	11	14	ASAP		100	Trace Example Schedule #1
14	8388650	Task 4	10/12/2011	10/18/2011	13	16	ASAP		100	Trace Example Schedule #1
16	8388648	Task 6	10/19/2011	10/25/2011	15,14,21	17	ASAP		100	Trace Example Schedule #1
20	8388644	Task 10	10/5/2011	10/11/2011	11	21,22SS+2 d	ASAP		200	Trace Example Schedule #1
21	8388643	Task 11	10/12/2011	10/18/2011	20	16,23FF+4 d	ASAP		200	Trace Example Schedule #1

Figure 10-8: Driving Path Output Tab Example

Section 11: DCMA 14 Point Assessment

Initiating the DCMA 14 Point Assessment Report

The purpose of the DCMA 14 Point Report is to provide the user with the data that DCMA uses to evaluate a schedule in the formats they use. The STAT tool developers have tried to provide the data as close as we can to what DCMA would be looking at.

To initiate this analysis function, select the DCMA 14 Point icon from the MS Project toolbar. This icon initiates the automated wizard to lead the user through four simple steps to produce a DCMA 14 Point output report. When the icon is initiated a Caution box will appear as shown in Figure 11-1. This popup gives the user a list of three things that need to be considered before executing the module. If the user needs to make changes to the schedule before continuing, click Cancel and make the necessary changes. To remove Level of Effort (LOE) activities a filter needs to be in place that filters out the LOE activities. Manual scheduled tasks need to be changed to Auto scheduled. Margin/Reserve activities need to have their durations set to 0 if the Critical Path Test (CPT) and Critical Path Length Index (CPLI) are to be run. *Note: It is recommended that the user make a copy of the schedule before making changes and executing this module. This module saves the open*

schedule then makes changes during the CPT and CPLI calculations, it then closes the schedule without saving and opens the starting file that was saved.

If these things are done the user can click OK to continue.

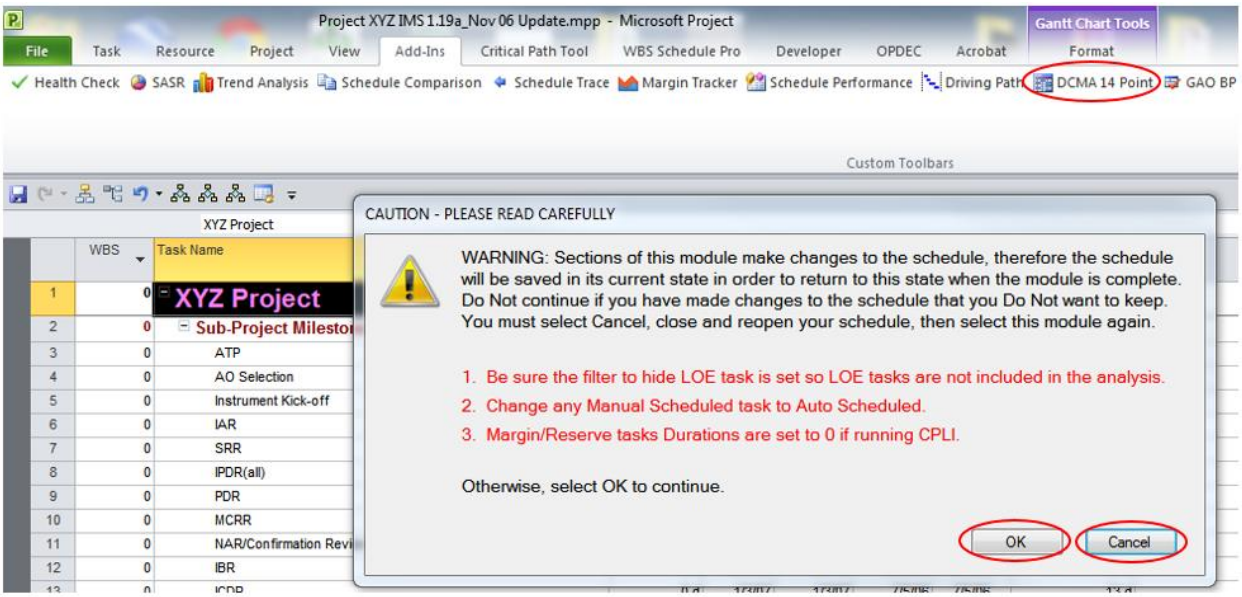


Figure 11-1: Caution Box for DCMA 14 Point Assessment Wizard

Step 1 produces a wizard dialogue box that allows the user to set the schedule "Status Date" on which the resulting assessment and analyses data will be based. Generally the status date will already be set within the project schedule file, but if not, STAT will alert the user to set the correct date within this wizard. This dialogue box also allows the user to select the correct baseline version to be used in calculating the various assessment metrics addressed within the DCMA 14 Point Assessment module. If no specific baseline is selected, the default will be "Baseline". See Figure 11-2. The filter selection allows the user to use the currently set filters or use no filters. "Use the Current Filters" is the default setting for this module and the filter that is set in the schedule, and any Auto Filters will remain in effect and only the selected portion of the schedule will be analyzed. This is where LOE tasks are filtered out of the analysis. If the Use No Filters is selected the program will remove all filters and analyze the complete schedule. See Figure 11-3

After selecting the desired Status Date, correct baseline version, and Filter Selection then click "Next".

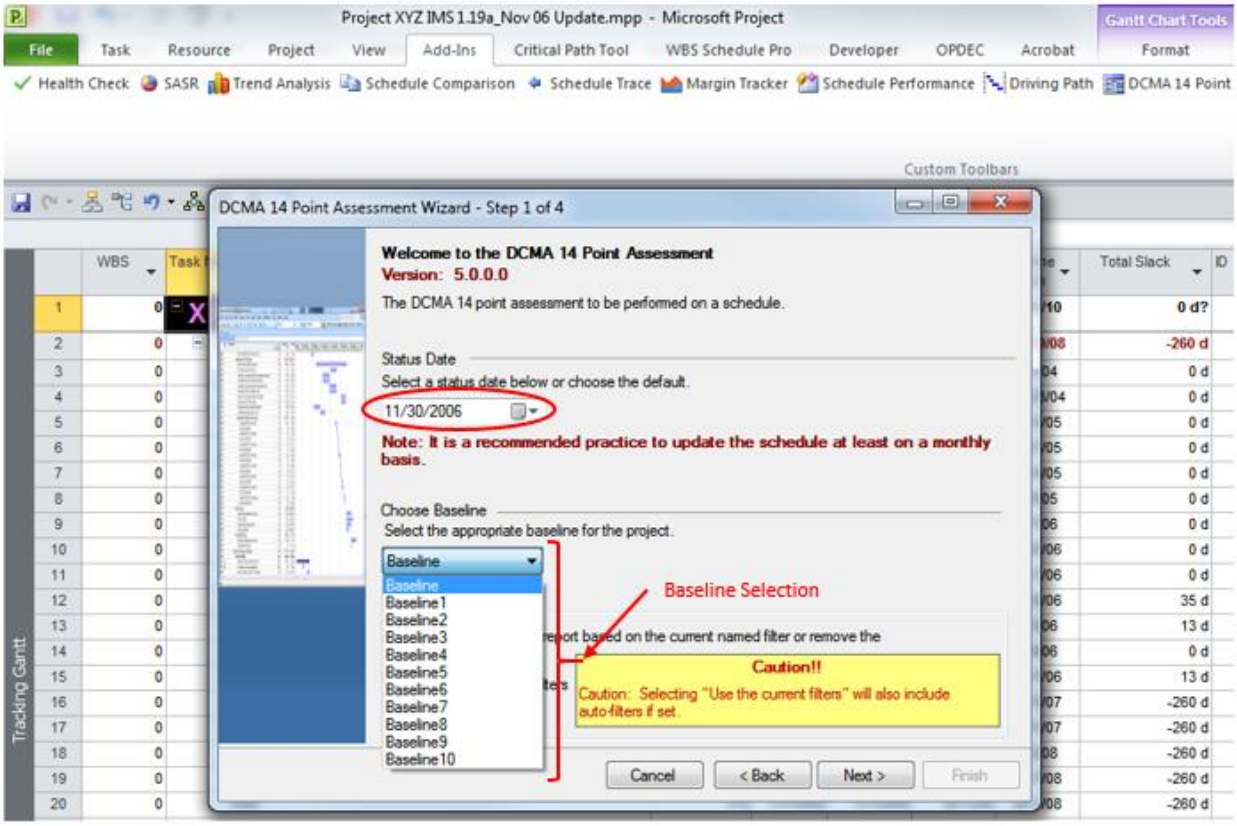


Figure 11-2: DCMA 14 Point Assessment Wizard – Step 1, Part 1

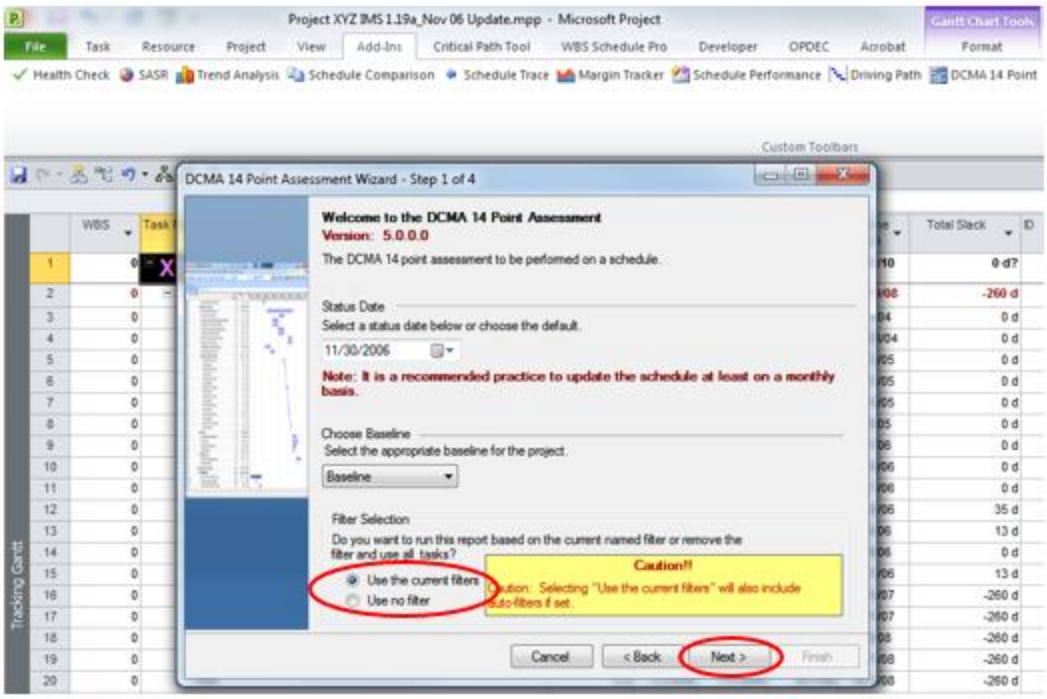


Figure 11-3: DCMA 14 Point Assessment Wizard – Step 1, Part 2

Step 2 produces a wizard dialogue box (see Figure 11-4) that allows the user to select an end activity or milestone that is used in calculating the Critical Path Length Index (CPLI) and perform the Critical Path Test (CPT). Note: If no task is selected, the CPLI and CPT will not be calculated. Activities can be selected by ID or Unique ID by clicking on the radial buttons Unique ID or ID. If the ID is used with a Master/Subproject schedule you may get multiple activities added to the list. If this occurs select the unwanted activities and click the Remove box. Only one activity can be left in this selection.

After completing the desired selection, click "Next".

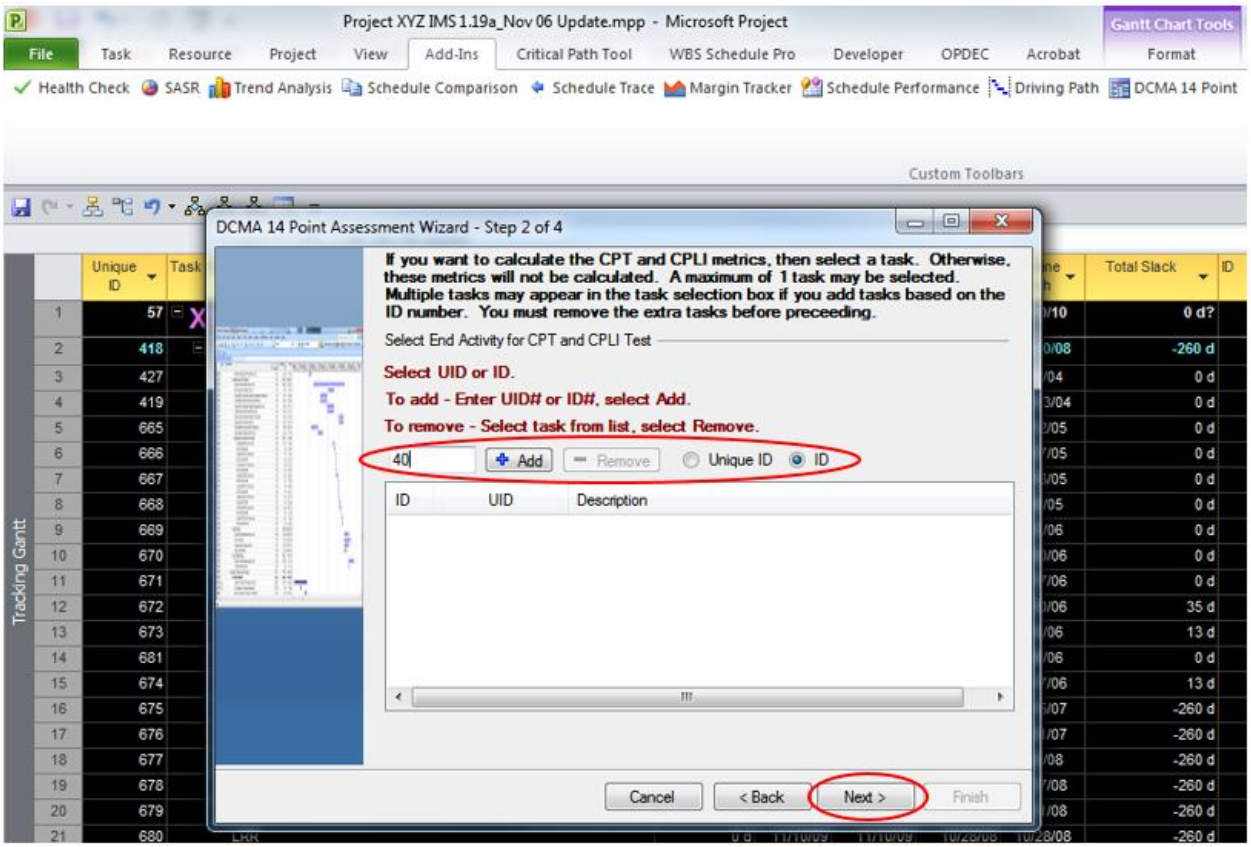


Figure 11-4: DCMA 14 Point Assessment Wizard – Step 2

Step 3 produces a wizard dialogue box (see Figure 11-5) that *allows the user to include Milestones in the DCMA 14 point analysis. The default is No because the standard process by DCMA does not include Milestones in the analysis. The second selection is to include tasks that are not baselined, clicking "No" will eliminate these activities from the analysis. "No" is the default and is the standard process used by DCMA, but the option to include them is available if desired.* The third selection allows the user to verify and/or change the end date that is to be used in the CPLI calculation. The date provided is the baseline finish date of the chosen activity or the current date if the activity is not baselined. Be sure the date is the correct date to calculate the CPLI. The forth selection asks the user for a Number field to use in calculating the driving path to the CPLI chosen activity. The selected

Number field will be cleared and new data stored in it. Note: An error will occur when the selected Number field has a lookup or formula assigned and a popup will ask the user to select another field or remove the lookup/formula before proceeding. The final selection on this dialogue box (see Figure 11-6) allows the user to select the location where they wish the DCMA 14 Point Excel output report to be exported and saved.

After completing the desired Step 3 choices, click "Next".

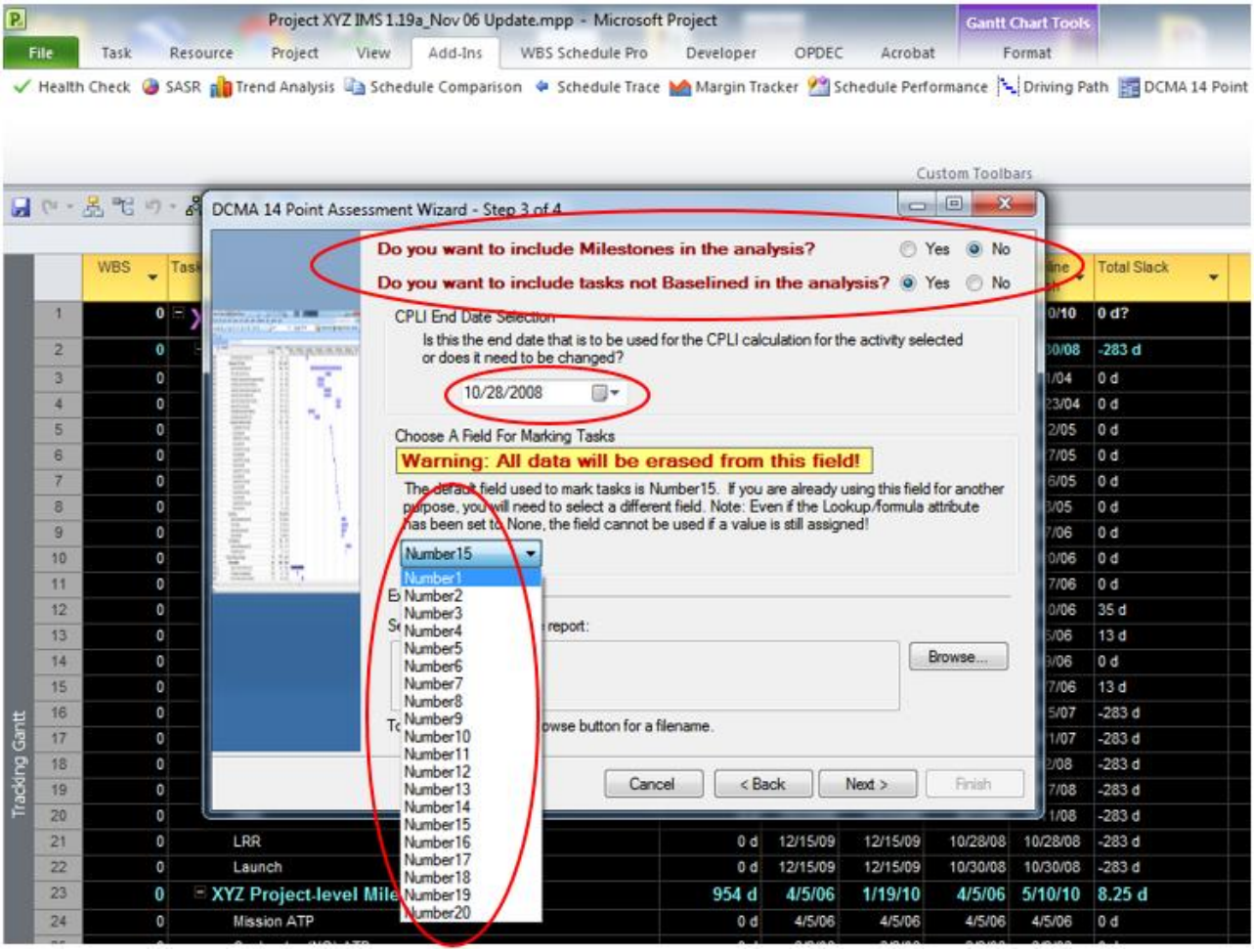


Figure 11-5: DCMA 14 Point Assessment Wizard – Step 3, Part 1

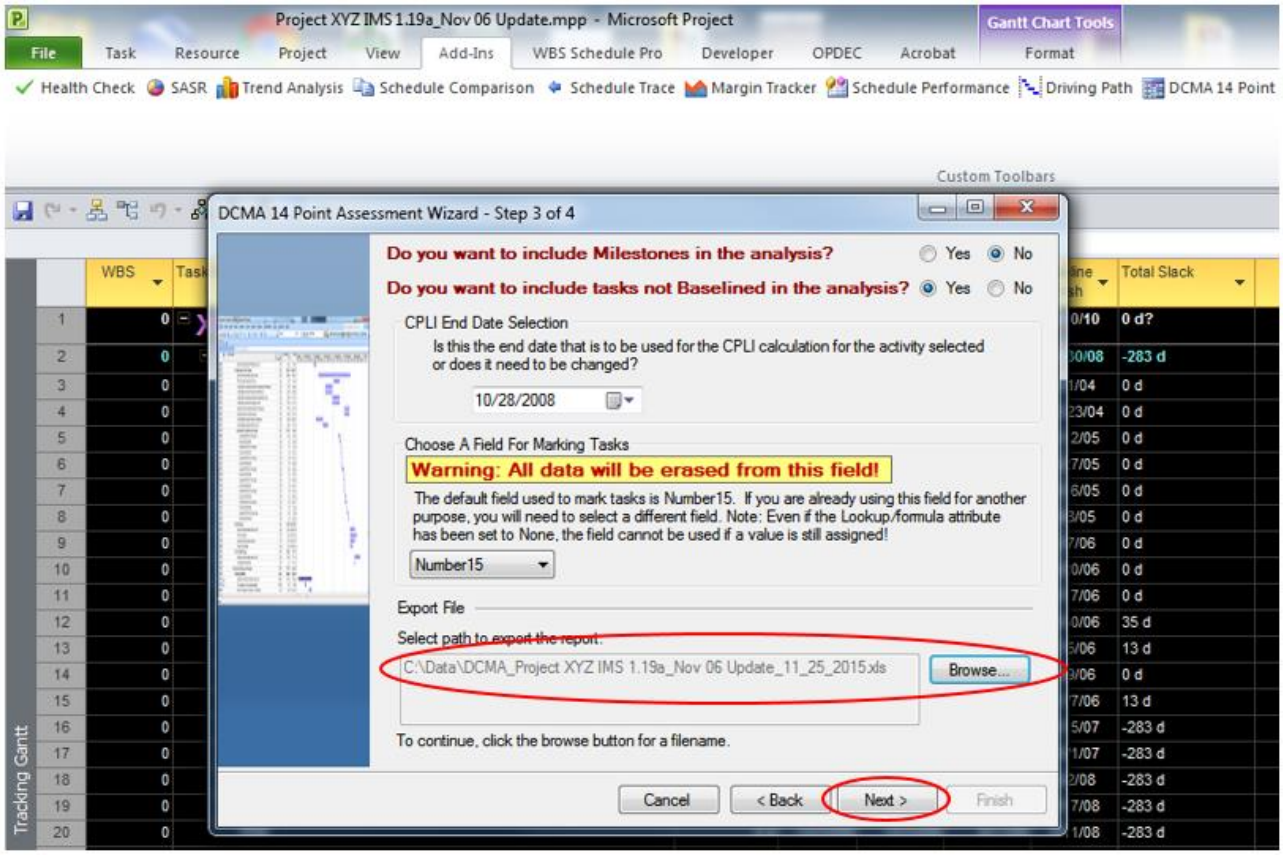


Figure 11-6: DCMA 14 Point Assessment Wizard – Step 3, Part 2

Step 4 of the Wizard produces a final dialogue box (see Figure 11-7) that allows the user to complete the final step in initiating the DCMA 14 point report. This dialogue box informs the user that Microsoft Excel 2000 or later must be installed. The user is also informed that the processing time for creating and transferring the results into the Excel template may take several minutes if the schedule file size is very large. A processing status is also provided to keep the user informed on the status of the tool during its gathering and formatting of data from the schedule and also the calculations being performed.

Click Finish to start the DCMA 14 Point Assessment Report processing. Once the processing has started it cannot be cancelled from the Wizard.

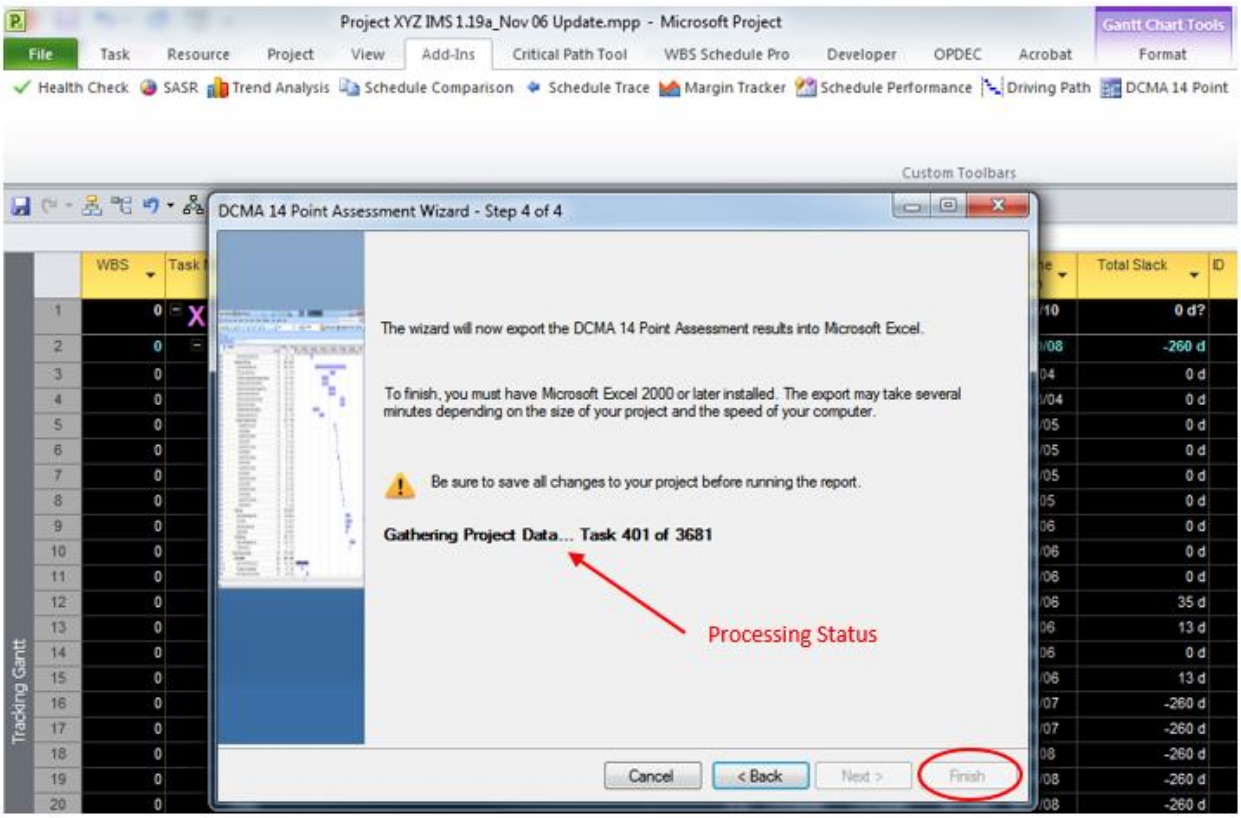
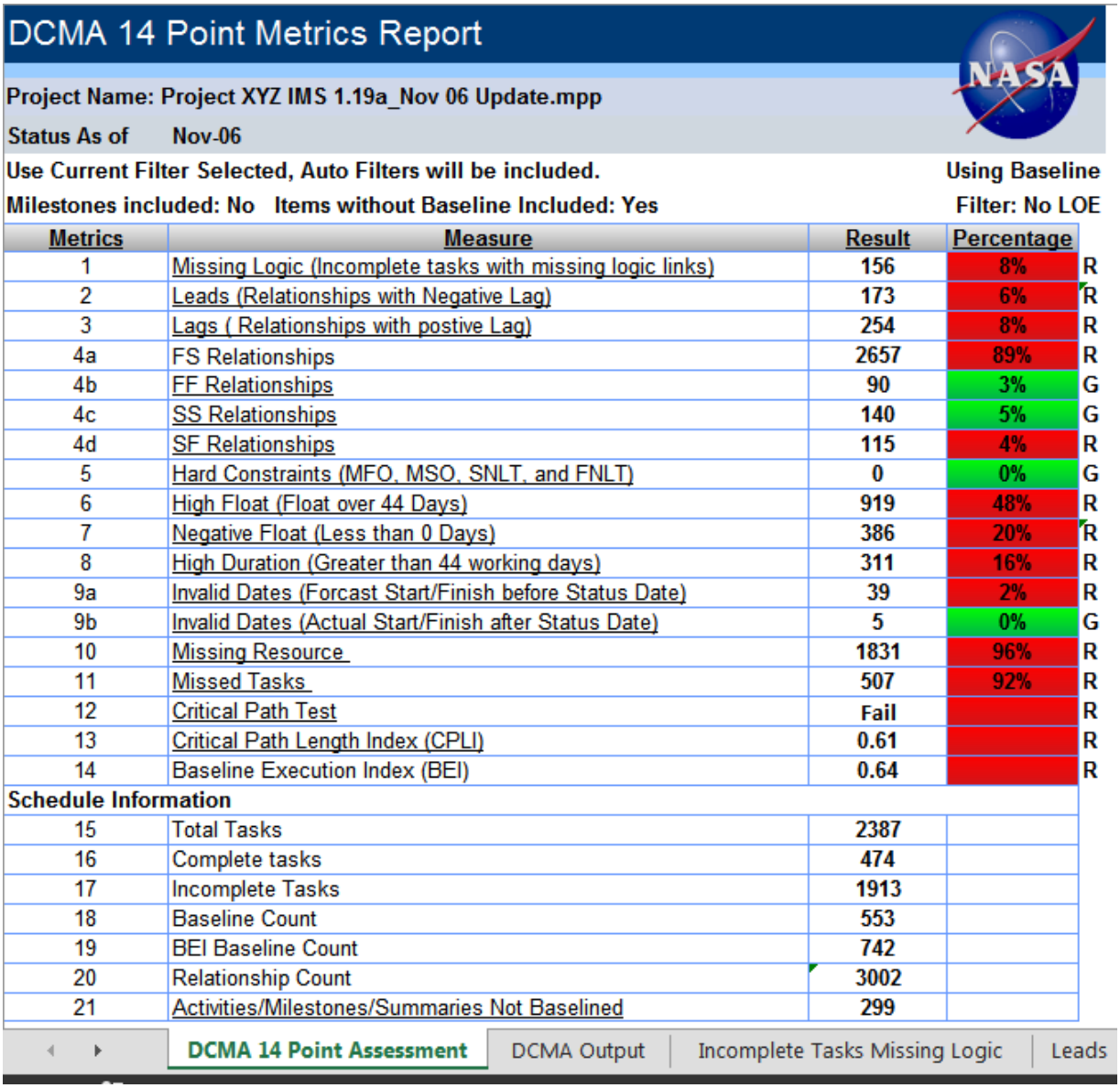


Figure 11-7: DCMA 14 Point Assessment Wizard – Step 4

DCMA 14 Point Assessment Results Output Formats

The DCMA 14 Point Assessment output is provided in two formats. The first format on the tab titled DCMA 14 Point Assessment) is a one page vertical listing of the 14 point data with links to the tabs that show the details behind the numbers. See Figure 11-8. The second format is on the second tab (titled DCMA Output) of the output report and displays the same data in a horizontal listing. See Figure 11-9. The report header contains the selections made in the wizard that affect the results in the report. The settings for Status date, Baseline used, Filter used, Milestones included, and items without Baselines included will be shown in the header.



DCMA 14 Point Metrics Report

Project Name: Project XYZ IMS 1.19a_Nov 06 Update.mpp

Status As of Nov-06

Use Current Filter Selected, Auto Filters will be included. Using Baseline

Milestones included: No Items without Baseline Included: Yes Filter: No LOE

Metrics	Measure	Result	Percentage	
1	Missing Logic (Incomplete tasks with missing logic links)	156	8%	R
2	Leads (Relationships with Negative Lag)	173	6%	R
3	Lags (Relationships with postive Lag)	254	8%	R
4a	FS Relationships	2657	89%	R
4b	FF Relationships	90	3%	G
4c	SS Relationships	140	5%	G
4d	SF Relationships	115	4%	R
5	Hard Constraints (MFO, MSO, SNLT, and FNLT)	0	0%	G
6	High Float (Float over 44 Days)	919	48%	R
7	Negative Float (Less than 0 Days)	386	20%	R
8	High Duration (Greater than 44 working days)	311	16%	R
9a	Invalid Dates (Forcast Start/Finish before Status Date)	39	2%	R
9b	Invalid Dates (Actual Start/Finish after Status Date)	5	0%	G
10	Missing Resource	1831	96%	R
11	Missed Tasks	507	92%	R
12	Critical Path Test	Fail		R
13	Critical Path Length Index (CPLI)	0.61		R
14	Baseline Execution Index (BEI)	0.64		R
Schedule Information				
15	Total Tasks	2387		
16	Complete tasks	474		
17	Incomplete Tasks	1913		
18	Baseline Count	553		
19	BEI Baseline Count	742		
20	Relationship Count	3002		
21	Activities/Milestones/Summaries Not Baselined	299		

DCMA 14 Point Assessment | DCMA Output | Incomplete Tasks Missing Logic | Leads

Figure 11-8: DCMA 14 Point Assessment Results with Links

DCMA 14 Point Metrics Report

Project Name: Project XYZ IMS 1.19a_Nov 06 Update.mpp
Status As of 11/30/2006 Filter: No LOE Using Baseline
Use Current Filter Selected, Auto Filters will be included.
Milestones included: No Items without Baseline Included: Yes

							1		2		3	
							Goal - 5% or less		Goal - 0%		Goal - 5% or less	
Schedule	Total Tasks	Complete Tasks	Incomplete Tasks	Baseline Count	BEI Baseline Count	Relationship Count	Precedence Logic	%	Leads	%	Lags	%
	2387	474	1913	553	742	3002	156	8%	173	6%	254	8%

	4							5		6		7		8	
	Goal > 90%		Goal - 10% or less			Goal - 0%		Goal - 5% or less		Goal - 5% or less		Goal - 0%		Goal - 5% or less	
	FS	%	FF	SS	%	SF	%	Hard Constraints	%	Total Float > 44wd	%	Negative Float	%	Duration > 44wd	%
	2657	89%	90	140	8%	115	4%	0	0%	919	48%	386	20%	311	16%

	9				10		11		12	13	14
	Goal - 0%		Goal - 0%		Goal - 0%		Goal - 5% or less		Goal - Pass	0.95 or Greater	0.95 or Greater
	·valid orcast ·ates	%	Invalid Actual Dates	%	Resources	%	Missed Tasks	%	Critical Path Test (Pass / Fail)	Critical Path Length Index (CPLI)	Baseline Execution Index (BEI)
	39	2%	5	0%	1831	96%	507	92%	Fail	0.61	0.64

Figure 11-9: DCMA 14 Point Assessment Results DCMA Format

Understanding DCMA 14 Point Assessment Results

The following is an explanation of each of the metrics shown in Figures 11-8 and 11-9. This explanation gives the benefits of the metrics, what is included in each, and how the percentage is calculated.

Metric #1 Logic: Helps to identify how well or poorly the schedule is linked together. Even if the links exist, the logic still needs to be verified by the technical leads to ensure that the links make sense. Any "Incomplete Task" that is missing a predecessor, a successor or both is counted in this metric. The percentage is calculated by dividing the # of tasks missing logic by the # of incomplete tasks. This percentage should not exceed 5%. A listing of these tasks is contained in the Excel workbook and can be accessed by clicking on the underlined description. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #2 Leads: The critical path and any subsequent analysis can be adversely affected by using leads (negative lags). The use of leads distorts the total float in the schedule and may cause resource conflicts. Any "Incomplete Task" that has a lead (negative lag) in its predecessor is counted in this metric. The percentage is calculated by dividing the # of tasks with leads by the # of incomplete tasks. The goal for this metric is 0 leads. A listing of these tasks is contained in the Excel workbook

and can be accessed by clicking on the underlined description. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #3 Lags: The critical path and any subsequent analysis can be adversely affected by using lags. Lag should not be used to manipulate float/slack or to restrain the schedule. Any "Incomplete Task" that has a lag in its predecessor is counted in this metric. The percentage is calculated by dividing the # of tasks with lags by the # of incomplete tasks. The goal for this metric is not to exceed 5% lags. A listing of these tasks is contained in the Excel workbook and can be accessed by clicking on the underlined description. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #4 Relationship Types: The Finish-to-Start (FS) relationship type ("once the predecessor is finished, the successor can start") provides a logical path through the program and should account for at least 90% of the relationship types being used. The Start-to-Finish (SF) relationship type is counter-intuitive ("the successor can't finish until the predecessor starts") and should only be used rarely and with detailed justification. Any predecessor relationship of any "Incomplete Task" is counted in this metric. The percentage is calculated by dividing the # of each type of relationships by the total # of relationships. The goal for this metric is at least 90% for FS relationships, less than 10% for SS and FF combined relationships and No SF relationships. A separate listing of the SS, FF, and SF relationships can be accessed by clicking on the underlined description. There is not a listing for the FS relationships. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #5 Hard Constraints: Using hard constraints [Must-Finish-On (MFO), Must-Start-On (MSO), Start-No-Later-Than (SNLT), and Finish-No-Later-Than (FNLT)] will prevent tasks from being moved by their dependencies and, therefore, prevent the schedule from being logic-driven. Soft constraints such as As-Soon-As-Possible (ASAP), Start-No-Earlier-Than (SNET), and Finish-No-Earlier-Than (FNET) enable the schedule to be logic-driven. Any "Incomplete Task" that has a Hard Constraint is counted in this metric. The percentage is calculated by dividing the # of tasks with Hard Constraints by the # of incomplete tasks. The goal for this metric is not to exceed 5%. A listing of the tasks with Hard Constraints is contained in the Excel workbook and can be accessed by clicking on the underlined description. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #6 High Float: A task with total float over 44 working days may be a result of missing predecessors and/or successors. If the percentage of tasks with excessive total float (float > 44 days) exceeds 5%, the network may be unstable and may not be logic-driven. Any "Incomplete Task" that has total float greater than 44 working days is counted in this metric. The percentage is calculated by dividing the # of tasks with high float by the # of incomplete tasks. This percentage should not exceed 5%. A listing of these tasks is contained in the Excel workbook and can be accessed by clicking on the underlined description. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #7 Negative Float: This metric helps identify tasks that are delaying completion of one or more milestones. Tasks with negative float should have an explanation and a corrective action plan to mitigate the negative float. Any "Incomplete Task" that has total float less than 0 working days is counted in this metric. The percentage is calculated by dividing the # of tasks with negative float by the # of incomplete tasks. Ideally, there should not be any negative float in the schedule. A listing of these tasks is contained in the Excel workbook and can be accessed by clicking on the underlined description. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #8 High Duration: This metric helps to determine whether or not a task can be broken into two or more discrete tasks rather than one. This helps to make tasks more manageable which provides better insight into cost and schedule. Any "Incomplete Task" that has a duration greater than 44 working days is counted in this metric. The percentage is calculated by dividing the # of tasks with high durations by the # of incomplete tasks. This percentage should not exceed 5%. A listing of these tasks is contained in the Excel workbook and can be accessed by clicking on the underlined description. *Note: If "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #9 Invalid Dates: A task should have forecast start and forecast finish dates that are in the future relative to the status date of the IMS. Also a task should not have actual start or actual finish dates that are in the future relative to the status date of the IMS. Any "Incomplete Task" that has a forecast start/finish date prior to the IMS status date or has an actual start/finish date beyond the IMS status date is counted in this metric of an invalid date. The percentage is calculated by dividing the # of tasks with invalid dates by the # of incomplete tasks. There should not be any invalid dates in the schedule. A listing of these tasks is provided in the Excel workbook and can be accessed by clicking on the underlined description. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #10 Resources: This metric provides verification that all tasks with durations greater than zero have dollars or hours assigned. Note: some contractors may not load their resources into the IMS. Any "Incomplete Task" without dollars/hours assigned is counted in this metric. The percentage is calculated by dividing the # of tasks without dollars/hours by the # of incomplete tasks. The goal for this metric is 0% without resources. A listing of these tasks is provided in the Excel workbook and can be accessed by clicking on the underlined description. *Note: If "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Metric #11 Missed Tasks: This metric helps identify how well or poorly the schedule is meeting the baseline plan. Any "Task" that is supposed to be completed already (baseline finish date on or before the status date and the actual finish date or forecast finish date (early finish date) is after the baseline finish date is counted in this metric. The percentage is calculated by dividing the # of Missed Tasks by the "Baseline Count". The number of "Missed Tasks" should not exceed 5%. A listing of these tasks is contained in the Excel workbook and can be accessed by clicking on the underlined description. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task.*

Metric #12 Critical Path Test: This metric helps identify broken logic that is the result of missing predecessors and/or successors on tasks where they are needed. If the project completion date (or other milestone) is not delayed in direct proportion (assuming zero float) to the amount of intentional slip (600 days about 3 years) that is introduced into the schedule as part of this test, then there is broken logic somewhere in the network. The IMS passes the Critical Path Test if the project completion date (or other task/milestone) shows a very large negative total float number or a revised Early Finish date that is in direct proportion (assuming zero float) to the amount of intentional slip (600 days in this case) that was applied. If the task being slipped has 10 days total float, for example, you would only expect to see a 590 day slip to the early finish date of the targeted milestone. If there are multiple calendars in the project, the targeted milestone may not be delayed in direct proportion, but there should still be a significant slip. The module selects all critical tasks along with any task that is in progress and adds 600 days to the remaining duration and then looks at the impact to the task/milestone that was selected in the wizard as an end point. A listing of these tasks along with their Pass/Fail status is contained in the Excel workbook and can be accessed by clicking on the underlined description. If any activity fails the test then the summary sheets are populated with Fail. Any activity that has large float values (greater than 75 days) will fail this test, and the analysts will need to do father analysis on these tasks. The summary sheets can be manually changed by the analysts if a deeper analysis of the failed activities justify the change. *Note: There is no impact to this module if "Include Milestones" or "Include Non Baselined Activities" is selected in the wizard.*

Metric #13 Critical Path Length Index (CPLI): This metric measures the critical path "realism" relative to the planned (baseline) finish date. Before calculating the CPLI, the analysts must first verify that the critical path makes sense and that enough of the schedule metrics have indicated that the critical path is "Believable". The "Critical Path Length (CPL)" is calculated from time now to the end of the task/milestone that was selected in the wizard. The CPLI is calculated as follows: CPLI= (CPL + Total Float) / CPL. The target for this metric is "1.00" with a threshold of "0.95". A CPLI of 1.00 or greater indicates that there is no negative float in the schedule. Therefore, assuming that the schedule is appropriately linked, the program has a "realistic" chance of completing the contract on time. A CPLI of less than 0.95 indicates that there is a large amount of negative float in the schedule in proportion to the time remaining until planned completion. As a result, the program may NOT have a "realistic" chance of completing the contract by the baseline finish date. The Excel workbook shows the task that was used to calculate the CPL and float. This tab can be accessed by clicking on the underlined description. Also the following tab in the workbook "CPL Driving Path" shows the critical or driving path to the selected activity/milestone. *Note: There is no impact to this module if "Include Milestones" or "Include Non Baselined Activities" is selected in the wizard.*

Metric #14 Baseline Execution Index (BEI): This metric measures the number of tasks that were completed as a ratio to those tasks that should have been completed to date according to the original (baseline) plan. The BEI is calculated as follows: BEI= Completed Tasks / BEI Baseline Count. Completed tasks are Total Tasks that have an actual finish date. BEI Baseline Count is any Total Tasks that have a baseline finish date on or before the status date plus any tasks missing baseline start or finish dates. Note: Tasks missing baseline dates should be included in the BEI Baseline Count until the problem is fixed. The target for this metric is "1.00" with a threshold of "0.95". Greater than 1.00 is favorable, less than 1.00 is unfavorable. *Note: If "Include Milestones" is*

selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in the Completed Tasks count for this section.

Schedule Information

Total Tasks: The lowest level discrete task. They are identified as Tasks that are not Summary tasks or Subproject tasks or have an earned value type of Level of Effort (LOE) or tasks with a duration of zero (Milestone). *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Completed Tasks: The number of tasks that have been completed. They are identified as a Total Task that has an Actual Finish date entered in the IMS. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Incomplete Tasks: The number of tasks that have not been completed. They are identified as a Total Task that does not have an Actual Finish date entered in the IMS. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Baseline Count: The number of tasks that were planned to be done by the status date. They are identified as a Total Task that are baselined to finish on or before the IMS status date. Used to calculate the Missed Tasks in Metric #11. . *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task.*

BEI Baseline Count: The number of tasks that were planned to be done by the status date plus all the tasks that are missing baseline start or baseline finish dates. They are identified as a Total Task that are baselined to finish on or before the IMS status date plus any Total Task that is missing baseline start or finish dates. Used to calculate the Baseline Execution Index (BEI) in Metric #14. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task.*

Relationship Count: The total number of relationships there are in the schedule. They are identified as out of the Incomplete Tasks, the number of Finish-to-Start (FS), Finish-to-Finish (FF), Start-to-Start (SS), and Start-to-Finish (SF) relationships that exist in the schedule. Used to calculate the percentage of each of the four relationship types in Metric #4. *Note: If "Include Milestones" is selected in the wizard, the milestones are considered the same as a Task and if "Include Non Baselined Activities" is selected they will be included in this analysis section.*

Activities/Milestones/Summaries Not Baselined: The total number of activities, milestones and summaries that are not baselined. The Not Baselined tab gives a listing of these ID's and contains a Type (Activity, Milestone, or Summary). *Note: The Include Milestones and Include Non Baselined Tasks does not affect the items in this element.*

Section 12: GAO Best Practices

Initiating the GAO Assessment Report

The success of a program depends in part on having an integrated and reliable master schedule that defines when and how long work will occur and how each activity is related to the others. A schedule is necessary for government acquisition programs for many reasons. The program schedule provides not only a road map for systematic project execution but also the means by which to gauge progress, identify and resolve potential problems, and promote accountability at all levels of the program. A schedule provides a time sequence for the duration of a program's activities and helps everyone understand both the dates for major milestones and the activities that drive the schedule. The purpose of the GAO Assessment Report is to provide the user with a tool for obtaining schedule data indicating how well the schedule is structured and is being followed based on the GAO 10 Best Practices. *It should be noted that the metrics and assessment information developed for this STAT 5.0 module are taken from the GAO Schedule Assessment Guide (GAO-12-120G) dated May 2012.*

To initiate this analysis function, select the GAO Assessment icon from the MS Project toolbar. This icon initiates the automated wizard to lead the user through four simple steps to produce a GAO Assessment output report.

Step 1 produces a wizard dialogue box that allows the user to set the schedule "Status Date" on which the resulting assessment and analysis data will be based. Generally the status date will already be set within the project schedule file, but if not, STAT will alert the user to set the correct date within this wizard. This dialogue box also allows the user to select the correct Baseline version to be used in calculating the various assessment metrics addressed within the GAO Assessment module. If no specific baseline is selected, the default version will be set on "Baseline". See Figure 12-1.

After selecting the desired Status Date and correct Baseline Version, then click "Next".

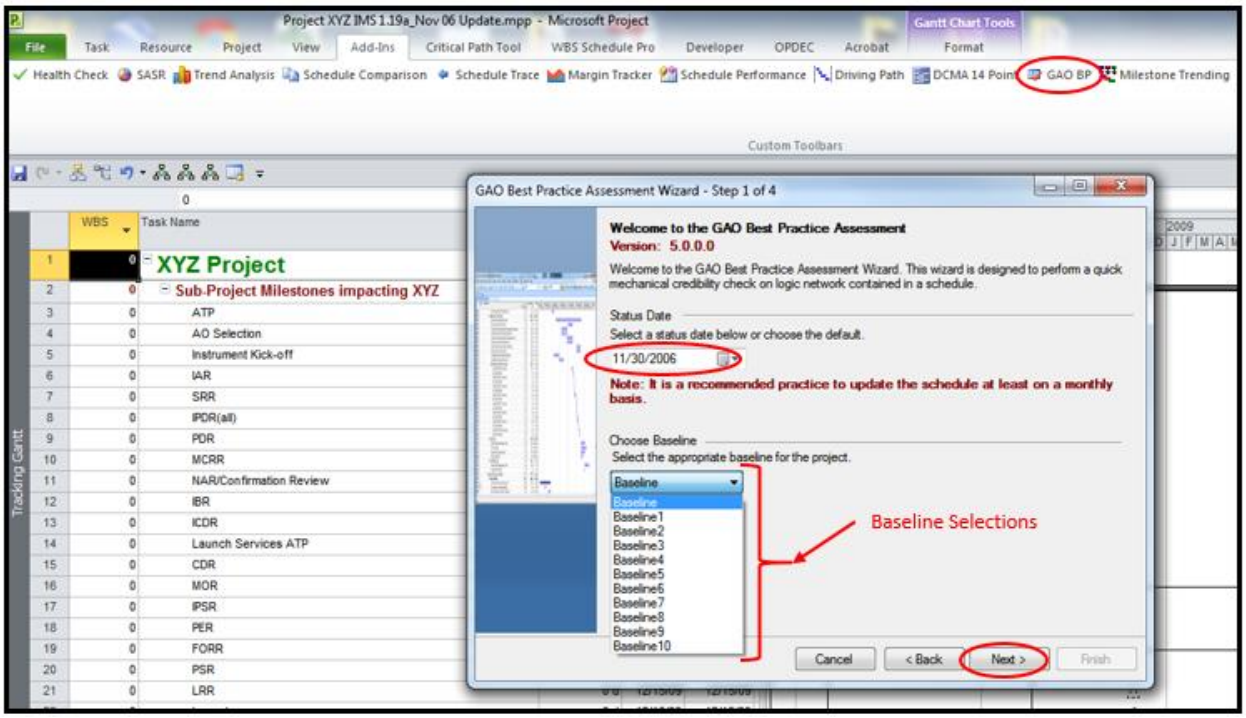


Figure 12-1: GAO Assessment Report Wizard – Step 1

Step 2 produces a wizard dialogue box (see Figure 12-2) that allows the user to indicate the number of total slack days that is considered excessive for this schedule. The default is set to 0 but a reasonable value should be supplied by the analyst. The Filter Selection allows the user to use the currently set filters or use no filters. "Use No Filter" is the default setting and will remove all filters and analyze the complete schedule. If the "Use the Current Filters" is selected, the filter that is set in the schedule and any Auto Filters will remain in effect and only the selected portion of the schedule will be analyzed.

After completing the desired Step 2 choices, click "Next."

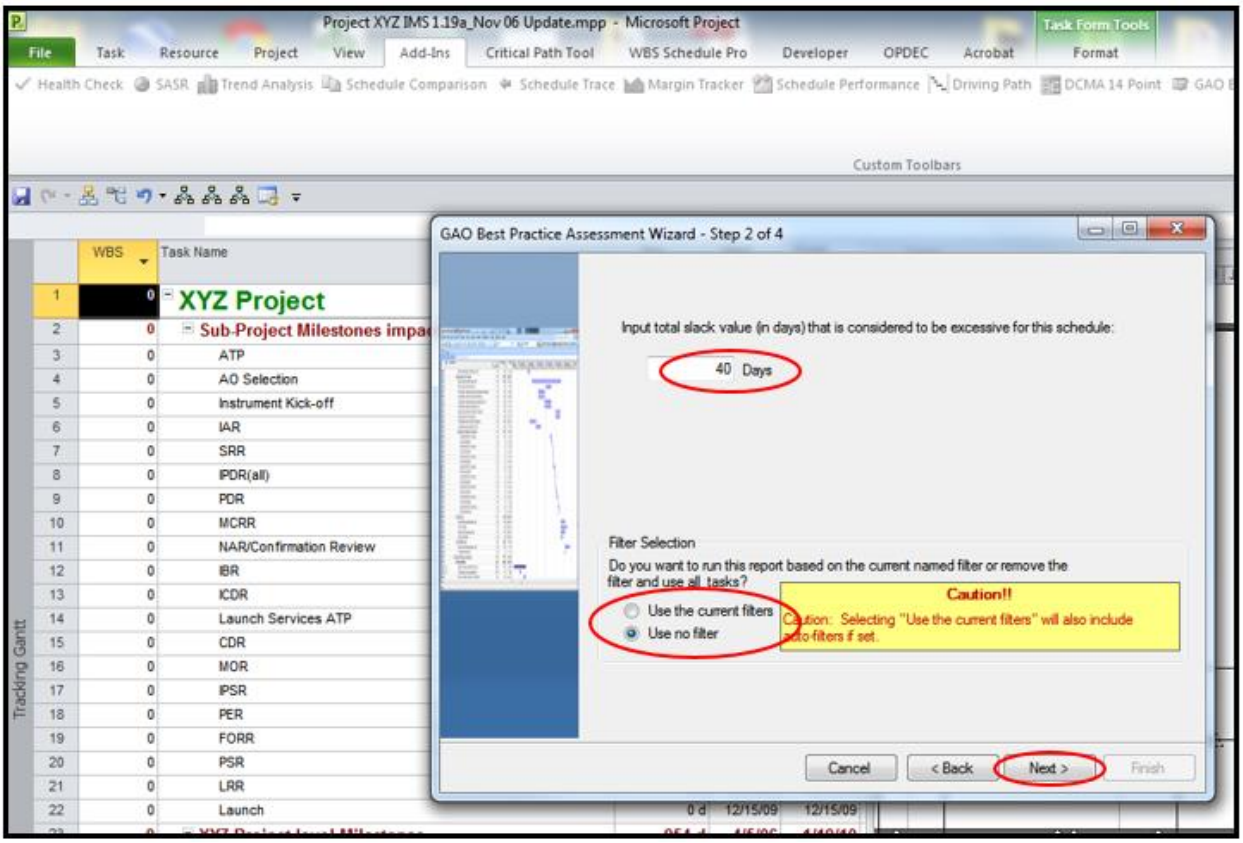


Figure 12-2: GAO Assessment Report Wizard – Step 2

Step 3 produces a wizard dialogue box (see Figure 12-3) that allows the user to select the appropriate units for the durations of the schedule. The default is set to Days, but Year, Month, Week, Hour, or Minutes can be selected. A browse function is provided to allow the user to select the location where they would like to store/export the Excel output file.

After completing the desired Step 3 choices, click "Next."

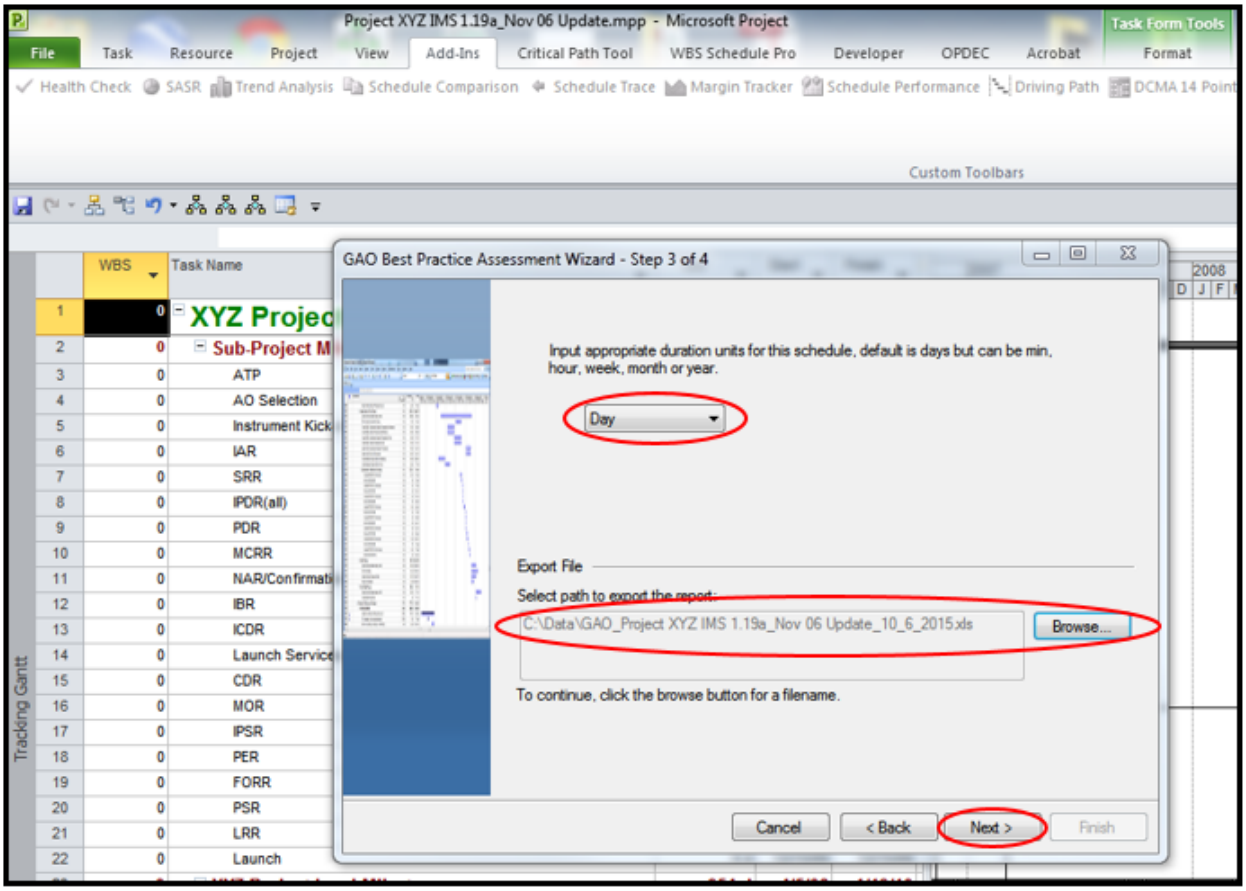


Figure 12-3: GAO Assessment Report Wizard – Step 3

Step 4 of the Wizard produces a final dialogue box (see Figure 12-4) that allows the user to complete the final step in initiating the schedule performance report. This dialogue box informs the user that Microsoft Excel 2000 or later must be installed. The user is also informed that the processing time for creating and transferring the results into the Excel template may take several minutes if the schedule file size is very large. A processing status is also provided to keep the user informed on the status of the tool during its gathering and formatting of data from the schedule and also the calculations being performed.

Click "Finish" to start the GAO Assessment Report processing.

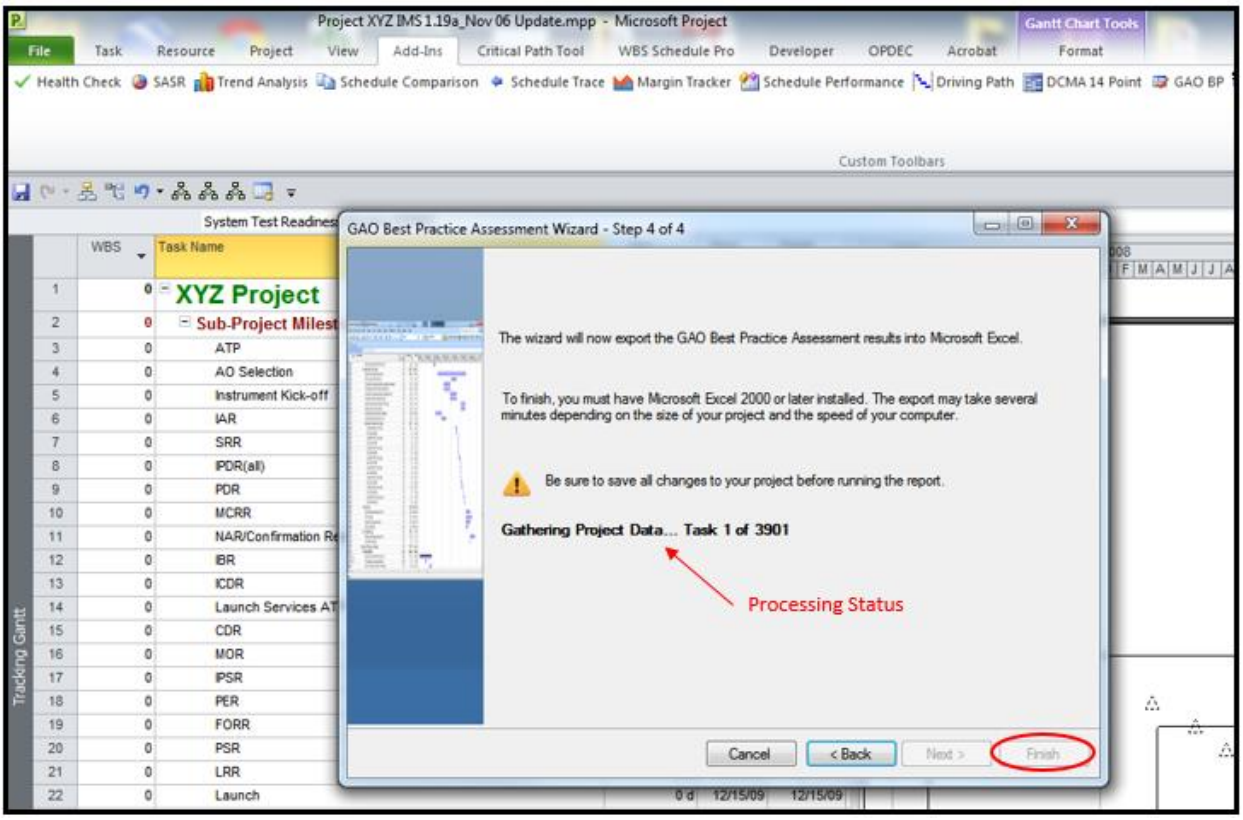
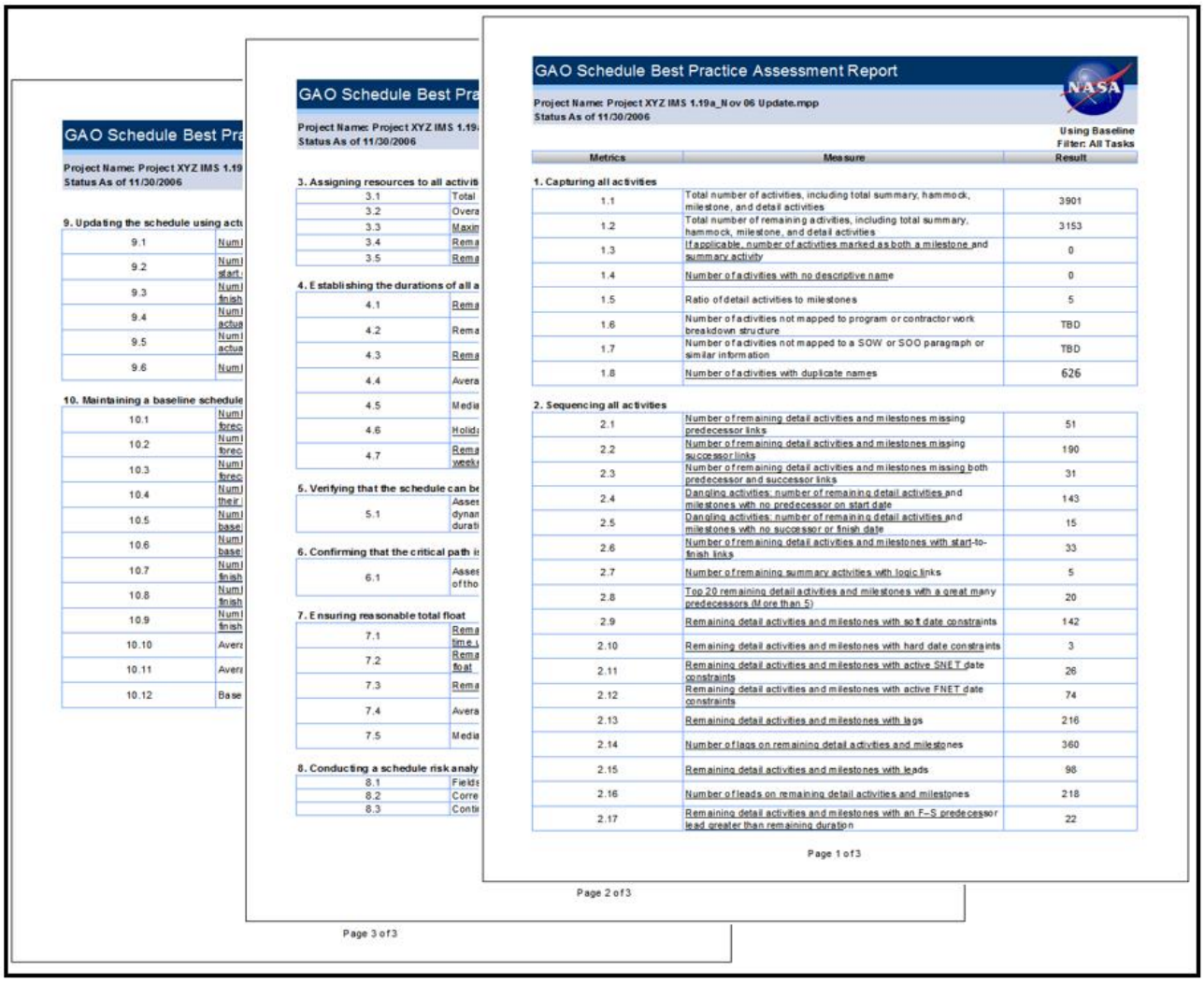


Figure 12-4: GAO Assessment Report Wizard – Step 4

Understanding the GAO Assessment Report Results:

The GAO Assessment output is formatted as a multi-page report in Excel listing 65 metrics organized by the 10 Best Practices (see Figure 12-5). The following paragraphs provide explanations and insights for each of the GAO 10 Best Practices and each of the metrics that may be helpful to the user in analyzing the schedule. In each Best Practice section of the output report, the underlined Measure description is a link to the Excel sheet that contains the detailed items that make up the numbers listed (see Figure 12-6). By clicking on the underlined description you will be taken to the sheet containing the detailed information. Also there is a link in the upper right hand corner of the detailed sheet called "Return to First Page" that will take you back to the summary page of the report when clicked. In cases where there is a TBD, the user will need to gather the data by analyzing the schedule and manually inputting the results.



GAO Schedule Best Practice Assessment Report

Project Name: Project XYZ IMS 1.19a_Nov 06 Update.mpp
Status As of 11/30/2006

Using Baseline
Filter: All Tasks

Metrics	Measure	Result
1. Capturing all activities		
1.1	Total number of activities, including total summary, hammock, milestone, and detail activities	3901
1.2	Total number of remaining activities, including total summary, hammock, milestone, and detail activities	3153
1.3	If applicable, number of activities marked as both a milestone and summary activity	0
1.4	Number of activities with no descriptive name	0
1.5	Ratio of detail activities to milestones	5
1.6	Number of activities not mapped to program or contractor work breakdown structure	TBD
1.7	Number of activities not mapped to a SOW or SOO paragraph or similar information	TBD
1.8	Number of activities with duplicate names	626
2. Sequencing all activities		
2.1	Number of remaining detail activities and milestones missing predecessor links	51
2.2	Number of remaining detail activities and milestones missing successor links	190
2.3	Number of remaining detail activities and milestones missing both predecessor and successor links	31
2.4	Dangling activities: number of remaining detail activities and milestones with no predecessor on start date	143
2.5	Dangling activities: number of remaining detail activities and milestones with no successor or finish date	15
2.6	Number of remaining detail activities and milestones with start-to-finish links	33
2.7	Number of remaining summary activities with logic links	5
2.8	Top 20 remaining detail activities and milestones with a great many predecessors (More than 5)	20
2.9	Remaining detail activities and milestones with soft date constraints	142
2.10	Remaining detail activities and milestones with hard date constraints	3
2.11	Remaining detail activities and milestones with active SNET date constraints	26
2.12	Remaining detail activities and milestones with active FNET date constraints	74
2.13	Remaining detail activities and milestones with lags	216
2.14	Number of lags on remaining detail activities and milestones	360
2.15	Remaining detail activities and milestones with leads	98
2.16	Number of leads on remaining detail activities and milestones	218
2.17	Remaining detail activities and milestones with an F–S predecessor lead greater than remaining duration	22

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Figure 12-5: GAO Assessment Report Output

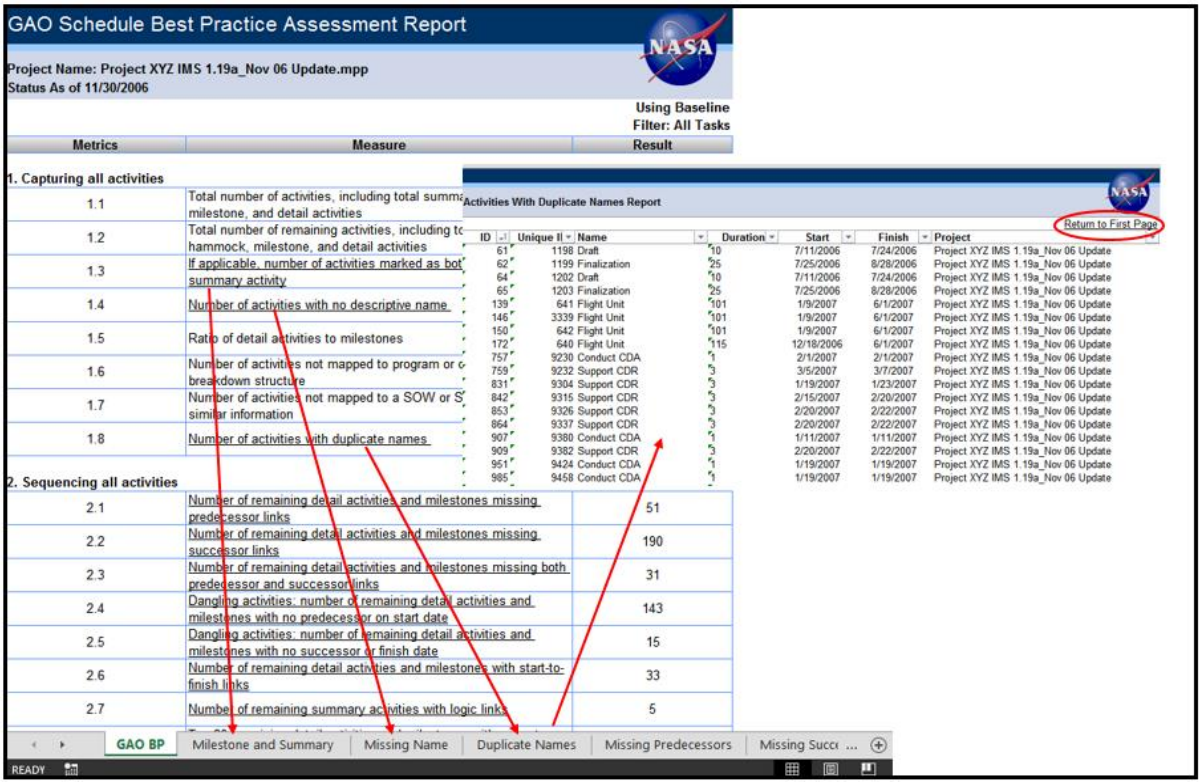

Figure 12-6: GAO Assessment Report Navigation

Best Practice 1: Capturing all Activities. The schedule should reflect all activities as defined in the project's work breakdown structure (WBS). The activities define in detail the work necessary to accomplish a project's objectives, including activities both the owner and contractor are to perform. Figure 12-7 provides an example of the eight metrics for this best practice.

1.1 Total number of activities in the schedule, includes summary, hammocks, milestones and detail activities. Note; hammocks are not used by Microsoft Project.

1.2 Total number of remaining activities in the schedule, includes summary, milestones and detail activities.

1.3 Activities in Microsoft Project (MSP) that have been marked as both a milestone and summary task. This is flagged because it makes no sense.

1.4 Blank names indicate an activity within MSP has no descriptive name. It may be a valid activity or it may not. These will need to be resolved case by case.

1.5 *Details/Milestone* is a rough indicator of the level of planning detail in the schedule. While there is no hard and fast threshold, 1 or 2 detail tasks per milestone is probably a very low level of detail, while 10 is probably highly detailed.

1.6 Activities not mapped to the WBS will require additional analysis as the analyst determines where the WBS data is stored in the schedule. This data can be entered manually when it is determined.

1.7 Activities not mapped to the Statement of Work (SOW) or Statement of Objectives (SOO) will require additional analysis as the analyst determines where the WBS data is stored in the schedule. This data can be entered manually when it is determined.

1.8 Duplicate activity names make it hard to analyze the schedule, and the activity name should be clear as to what the work is.

GAO Schedule Best Practice Assessment Report

Project Name: Project XYZ IMS 1.19a_Nov 06 Update.mpp
Status As of 11/30/2006

Using Baseline
Filter: All Tasks

Metrics	Measure	Result
1. Capturing all activities		
1.1	Total number of activities, including total summary, hammock, milestone, and detail activities	3901
1.2	Total number of remaining activities, including total summary, hammock, milestone, and detail activities	3153
1.3	If applicable, number of activities marked as both a milestone and summary activity	0
1.4	Number of activities with no descriptive name	0
1.5	Ratio of detail activities to milestones	5
1.6	Number of activities not mapped to program or contractor work breakdown structure	TBD
1.7	Number of activities not mapped to a SOW or SOO paragraph or similar information	TBD
1.8	Number of activities with duplicate names	626

Figure 12-7: GAO Assessment Report Best Practice 1

Best Practice 2: Sequencing all Activities. The schedule should be planned so that critical project dates can be met. To do this, activities need to be logically sequenced—that is, listed in the order in which they are to be carried out. In particular, activities that must be completed before other activities can begin (predecessor activities), as well as activities that cannot begin until other activities are completed (successor activities), should be identified. Date constraints and lags should be minimized and justified to help ensure that the interdependence of activities that collectively lead to the completion of events or milestones can be established and used to guide work and measure progress. Figure 12-8 provides an example of the seventeen metrics for this best practice.

2.1 This metric counts all remaining activities and milestones that have missing predecessors but have successors.
2.2 This metric counts all remaining activities and milestones that have missing successors but have predecessors.
2.3 This metric counts all remaining activities and milestones that have both missing successors and predecessors.
2.4 This metric counts all remaining activities and milestones that do not have a start predecessor but have predecessors that link to the finish.
2.5 This metric counts all remaining activities and milestones that do not have a finish successor but have successors that link from the start.

2.6 This metric counts all remaining activities and milestones that have a start to finish relationship. It is not recommended to use this type of relationship, they should be changed to a finish to start type relationship.
2.7 This metric counts the remaining summary activities that have logic relationships.
2.8 This metric counts the remaining activities that have a large number of predecessors. This metric has been limited to 20 activities or milestones that have the largest number of predecessors above 5. This assesses the schedule for path convergence. A relatively high number of predecessors may indicate a high risk area.
2.9 This metric counts all remaining activities and milestones that have soft constraints (Start No Earlier Than or Finish No Earlier Than constraints).
2.10 This metric counts all remaining activities and milestones that have hard constraints (Start No Later Than, Finish No Later Than, Must Start On, or Must Finish On constraints).
2.11 This metric counts all remaining activities and milestones that have Start No Earlier Than constraints that are controlling the start date of the activity or milestone.
2.12 This metric counts all remaining activities and milestones that have Finish No Earlier Than constraints that are controlling the finish date of the activity or milestone.
2.13 This metric counts all remaining activities and milestones that have Lags.
2.14 This metric counts all the relationships on remaining activities and milestones that have Lags.
2.15 This metric counts all remaining activities and milestones that have Leads (negative lags).
2.16 This metric counts all the relationships on remaining activities and milestones that have Leads (negative lags).
2.17 This metric counts all remaining activities and milestones with a Finish to Start predecessor lead greater than the remaining duration of the activity.

2. Sequencing all activities		
2.1	Number of remaining detail activities and milestones missing predecessor links	51
2.2	Number of remaining detail activities and milestones missing successor links	190
2.3	Number of remaining detail activities and milestones missing both predecessor and successor links	31
2.4	Dangling activities: number of remaining detail activities and milestones with no predecessor on start date	143
2.5	Dangling activities: number of remaining detail activities and milestones with no successor or finish date	15
2.6	Number of remaining detail activities and milestones with start-to-finish links	33
2.7	Number of remaining summary activities with logic links	5
2.8	Top 20 remaining detail activities and milestones with a great many predecessors (More than 5)	20
2.9	Remaining detail activities and milestones with soft date constraints	142
2.10	Remaining detail activities and milestones with hard date constraints	3
2.11	Remaining detail activities and milestones with active SNET date constraints	26
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2.13	Remaining detail activities and milestones with lags	216
2.14	Number of lags on remaining detail activities and milestones	360
2.15	Remaining detail activities and milestones with leads	98
2.16	Number of leads on remaining detail activities and milestones	218
2.17	Remaining detail activities and milestones with an F–S predecessor lead greater than remaining duration	22

Figure 12-8: GAO Assessment Report Best Practice 2

Best Practice 3: Assigning Resources to all Activities. The schedule should reflect the resources (labor, materials, overhead) needed to do the work, whether they will be available when needed, and any funding or time constraints. Figure 12-9 provides an example of the five metrics for this best practice.

3.1 Total number of resources used on the schedule.
3.2 Total number of resources that are over allocated.
3.3 Maximum units available per resource. Individuals should be available between 0 and 100 percent of full time, and resource groups should have a realistic number of individuals available to perform the work.
3.4 Remaining detail activities with resource assignments.
3.5 Remaining detail activities without resource assignments.

3. Assigning resources to all activities		
3.1	Total number of resources	71
3.2	Overallocated resources	16
3.3	Maximum units available per resource	See Tab
3.4	Remaining detail activities with assignments	140
3.5	Remaining detail activities without assignments	1928

Figure 12-9: GAO Assessment Report Best Practice 3

Best Practice 4: Establishing the Durations of all Activities. The schedule should realistically reflect how long each activity will take. When the duration of each activity is determined, the same rationale, historical data, and assumptions for cost estimating should be used. Durations should be reasonably short and meaningful and allow for discrete progress measurement. Schedules that contain planning and summary planning packages as activities will normally reflect longer durations until broken into work packages or specific activities. Figure 12-10 provides an example of the seven metrics for this best practice.

4.1 This metric counts all remaining detail activities with dissimilar time units. All durations should be in the same unit, preferably days.
4.2 Remaining detail activities with durations less than 44 days. This should be the bulk of the activities so they are not listed in a separate sheet.
4.3 Remaining detail activities with durations greater than 44 days. These activities are listed on the tab for review.
4.4 Average duration of remaining detail activities.
4.5 Median duration of remaining detail activities.
4.6 Holidays and other exceptions by task calendar. The tab for this metric list the holidays and exceptions by calendar.
4.7 Remaining detail activities or milestones starting or finishing on a weekend or holiday. These may be legitimate but may stem from incorrect calendar assignments or specifications.

4. Establishing the durations of all activities		
4.1	Remaining detail activities with dissimilar time units	83
4.2	Remaining detail activities with durations less than 44 days	1603
4.3	Remaining detail activities with durations greater than 44 days	407
4.4	Average duration of remaining detail activities	42 Days
4.5	Median duration of remaining detail activities	17 Days
4.6	Holidays and other exceptions by task calendar	See Tab
4.7	Remaining detail activities or milestones starting or finishing on a weekend or holiday	40

Figure 12-10: GAO Assessment Report Best Practice 4

Best Practice 5: Verifying that the Schedule is Traceable Horizontally and Vertically. The detailed schedule should be horizontally traceable, meaning that it should link products and outcomes associated with other sequenced activities. These links are commonly referred to as "hand-offs" and serve to verify that activities are arranged in the right order for achieving aggregated products or outcomes. The integrated master schedule (IMS) should also be vertically traceable-that is, varying levels of activities and supporting sub-activities can be traced. Such mapping or alignment of levels enables different groups to work to the same master schedule. Figure 12-11 provides an example of the one metric for this best practice.

5.1 This metric needs to be evaluated by the analyst. The DCMA 14 point module of the STAT tool has a Critical Path Test (CPT) that can help answer the horizontal part of this best practice.

5. Verifying that the schedule can be traced horizontally and vertically		
5.1	Assessment of how critical and noncritical planned dates dynamically react to dramatic increases in predecessor activity durations	TBD

Figure 12-11: GAO Assessment Report Best Practice 5

Best Practice 6: Confirming that the Critical Path is Valid. The critical path should identify the program critical path—the path of longest duration through the sequence of activities. Establishing a valid critical path is necessary for examining the effects of any activity's slipping along this path. The program critical path determines the program's earliest completion date and focuses the team's energy and management's attention on the activities that will lead to the project's success. Figure 12-12 provides an example of the one metric for this best practice.

6.1 This metric is to assess the critical activities marked in the schedule as critical compared to the driving paths to key milestones. The STAT tool has a Driving Path module that can help determine the validity of the critical path.

6. Confirming that the critical path is valid		
6.1	Assessment of the driving paths to key milestones and comparison of those paths to activities marked as critical in the schedule	TBD

Figure 12-12: GAO Assessment Report Best Practice 6

Best Practice 7: Ensuring Reasonable Total Float. The schedule should identify reasonable float (or slack)—the amount of time by which a predecessor activity can slip before the delay affects the program's estimated finish date—so that the schedule's flexibility can be determined. Large total float on an activity or path indicates that the activity or path can be delayed without jeopardizing the finish date. The length of delay that can be accommodated without the finish date's slipping depends on a variety of factors, including the number of date constraints within the schedule and the amount of uncertainty in the duration estimates. As a general rule, activities along the critical path have the least amount of float/slack. Figure 12-13 provides an example of the five metrics for this best practice.

7.1 This metric counts all remaining detail activities and milestones with dissimilar total float time units. All float should be in the same units, preferably days.
7.2 Remaining detail activities and milestones with relatively high total float. High float is relative to the scope, length, and complexity of the schedule. Float should be reasonable and realistically reflect the flexibility of the schedule. Note: This high float/slack value is an input in the wizard for this module and the default is set to 0 and should be changed to a more appropriate value for the schedule being analyzed.
7.3 Remaining detailed activities and milestones with negative total float/slack.
7.4 Average total float/slack value of remaining detail activities and milestones.
7.5 Median total float/slack value of remaining detail activities and milestones.

7. Ensuring reasonable total float		
7.1	Remaining detail activities and milestones with dissimilar total float time units	87
7.2	Remaining detail activities and milestones with relatively high total float	1231
7.3	Remaining detail activities with negative total float	465
7.4	Average total float value of remaining detail activities and milestones	126 Days
7.5	Median total float value of remaining detail activities and milestones	42 Days

Figure 12-13: GAO Assessment Report Best Practice 7

Best Practice 8: Conducting a Schedule Risk Analysis. A schedule risk analysis (SRA) uses a good critical path method (CPM) schedule and data about project schedule threats and opportunities along with minimum, maximum and most likely duration estimates to produce the SRA. With these inputs, an SRA uses a statistical simulation to predict the level of confidence in meeting a program's completion date, determine the time contingency needed for a level of confidence, and identify high-priority risks and opportunities. The baseline schedule should reflect the results of the SRA by including a buffer or reserve of extra time. Figure 12-14 provides an example of the three metrics for this best practice. The TBD's will require additional analysis by the analyst to determine where the SRA data is stored in the schedule. This data can be entered manually when it is determined.

8.1 Fields within the schedule used for Schedule Risk Assessment data to be determined by analyst.
8.2 Correlation measures within the schedule to be determined by analyst.
8.3 Contingency or reserve activities to be determined by analyst.

8. Conducting a schedule risk analysis		
8.1	Fields within the schedule used for SRA	TBD
8.2	Correlation measures within the schedule	TBD
8.3	Contingency activities	TBD

Figure 12-14: GAO Assessment Report Best Practice 8

Best Practice 9: Updating the Schedule with Actual Progress and Logic. Progress updates and logic provide a realistic forecast of start and completion dates for program activities. Maintaining the integrity of the schedule logic at regular intervals is necessary to reflect the true status of the program. To ensure that the schedule is properly updated, people responsible for the updating should be trained in critical path method scheduling. Figure 12-15 provides an example of the six metrics for this best practice.

9.1 Number of activities that have started but have not finished.
9.2 Number of remaining detail activities and milestones that have a start date earlier than the status date and does not have an actual start.
9.3 Number of remaining detail activities and milestones that have a finish date earlier than the status date and does not have an actual finish.
9.4 Number of remaining detail activities and milestones that have an actual start date past the status date.
9.5 Number of remaining detail activities and milestones that have an actual finish date past the status date.
9.6 Number of detailed activities and milestones performed out of sequence.

9. Updating the schedule using actual progress and logic		
9.1	Number of in-progress activities	291
9.2	Number of remaining detail activities and milestones that have a start date in the past but no actual start date	28
9.3	Number of remaining detail activities and milestones that have a finish date in the past but no actual finish date	39
9.4	Number of remaining detail activities and milestones that have an actual start date in the future	5
9.5	Number of remaining detail activities and milestones that have an actual finish date in the future	7
9.6	Number of detail activities performed out of sequence	61

Figure 12-15: GAO Assessment Report Best Practice 9

Best Practice 10: Maintaining a Baseline Schedule. A baseline schedule is the basis for managing the project scope, the time period for accomplishing it, and the required resources. The baseline schedule is designated the target schedule, subject to a configuration management control process, against which project performance can be measured, monitored, and reported. The schedule should be continually monitored so as to reveal when forecasted completion dates differ from planned dates and whether schedule variances will affect downstream work. A corresponding baseline document explains the overall approach to the project, defines custom fields in the schedule file, details ground rules and assumptions used in developing the schedule, and justifies constraints, lags, long activity durations, and any other unique features of the schedule. Figure 12-16 provides an example of the twelve metrics for this best practice.

10.1 Number of remaining detail activities and milestones that are forecasted to start or finish before their baseline dates.

10.2 Number of remaining detail activities and milestones that are forecasted to start or finish on their baseline dates.
10.3 Number of remaining detail activities and milestones that are forecasted to start or finish after their baseline dates.
10.4 Number of remaining detail activities that actually started before their baseline start date.
10.5 Number of remaining detail activities that actually started on their baseline start date.
10.6 Number of remaining detail activities that actually started after their baseline start date.
10.7 Number of detail activities and milestones that actually finished before their baseline finish date.
10.8 Number of detail activities and milestones that actually finished on their baseline finish date.
10.9 Number of detail activities and milestones that actually finished after their baseline finish date.
10.10 Average and median start variance.
10.11 Average and median finish variance.
10.12 Baseline execution index. (BEI = Cum # of Baseline Tasks Completed / Cum # of Baseline Tasks Scheduled for Completion)

10. Maintaining a baseline schedule		
10.1	Number of remaining detail activities and milestones that are forecasted to start or finish before their baseline dates	1055
10.2	Number of remaining detail activities and milestones that are forecasted to start or finish on their baseline dates	517
10.3	Number of remaining detail activities and milestones that are forecasted to start or finish after their baseline dates	863
10.4	Number of remaining detail activities that actually started before their baseline start date	2
10.5	Number of remaining detail activities that actually started on their baseline start date	122
10.6	Number of remaining detail activities that actually started after their baseline start date	160
10.7	Number of detail activities and milestones that actually finished before their baseline finish date	14
10.8	Number of detail activities and milestones that actually finished on their baseline finish date	480
10.9	Number of detail activities and milestones that actually finished after their baseline finish date	122
10.10	Average and median start variance	Average: 24.7 Days Median: 0 Days
10.11	Average and median finish variance	Average: 24.5 Days Median: 1 Days
10.12	Baseline execution index	BEI: 0.85

Figure 12-16: GAO Assessment Report Best Practice 10

Section 13: Milestone Trending

Initiating Milestone Trending

The purpose of the Milestone Trending module is to provide a management tool that reflects schedule accomplishment and trending on key events scheduled within the project's IMS. The output report produced by this module is formatted in simple fashion to show whether selected major milestones are being accomplished as scheduled per the established project baseline. Selected milestones will be tracked in a couple of different ways. First, this module will compare selected project milestone completion dates against their established baseline dates and provide stoplight indicators of the results. Second, it will compare current month milestone completion dates against the previous month's completion dates (or any prior schedule) and provide trending arrows to indicate whether performance is trending worse, better, or staying the same. It is hoped that this report will provide effective schedule insight to executive management or for use in key project reviews.

Prior to initiating the Milestone Trending wizard it is recommended that the user first identify those specific milestones that are to be assessed each month. Also, necessary milestone coding/formatting and filter creation should be in-place to provide ease and speed in future milestone reporting. As you will see in the following wizard instructions, there are two methods of selecting the desired milestones. One method is to individually select from a list of all milestones, or to use a preset filter which will automatically select the desired milestones for reporting.

To initiate this analysis function, select the Milestone Trending icon from the MS Project toolbar. *Note: If using Microsoft Project 2010 or 2013, this icon will be listed under the "Add-Ins" tab on the toolbar.* This icon initiates the automated wizard to lead the user through four simple steps to produce a Milestone Trending output report. (see Figure 13-1).

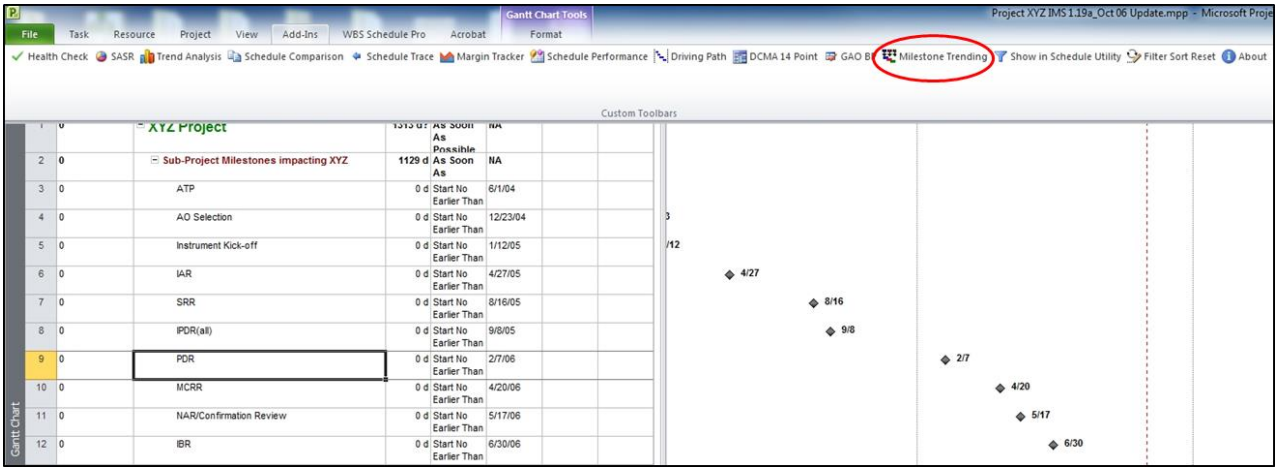


Figure 13-1: Milestone Trending Utility Tool Bar Selection

Step 1 produces a wizard dialogue box (see Figure 13-2) that allows the user to set the schedule "Status Date" on which the resulting Milestone Trending results will be based. If the correct status date is already set within Microsoft Project then the correct date will also be reflected in the wizard. This dialogue box also allows the user to select the correct baseline version to be used in calculating

the various assessment metrics addressed within this module. The version denoted as "Baseline" is the default selection if no other version is selected, however Baseline versions 1-10 can also be selected.

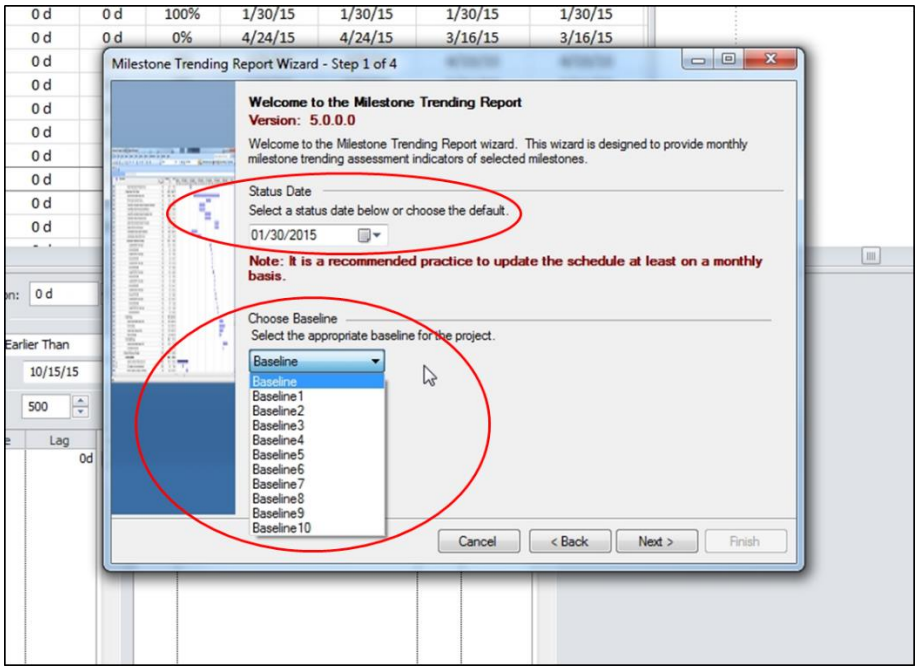


Figure 13-2: Milestone Trending Module Wizard – Step 1

Select "Next" to proceed to Step two of the wizard.

Step 2 produces a wizard dialogue box (see Figure 13-3) that provides the user the capability to start a new milestone trend report or to select an existing report from a prior period to add new data to. If "Yes" is selected then a new output report is created that reflects only the current month's milestone data. If "No" is selected, the wizard allows the user to browse and select an existing milestone trend report from a prior period for current period data to be added to. *Note: when selecting a previous Milestone Trending report, make sure that this file is **not** already open.*

The Step 2 dialogue box also provides the user the option to use a currently set filter or no filter at all. "Use No Filter" is the default setting and will remove all currently set filters before assessing the complete schedule. If the "Use Current Filters" is selected then the filter that is currently set in the schedule ***and any Auto Filters*** will remain in effect and only the selected portion of the schedule will be analyzed. *Additionally, when "Use Current Filters" is selected, then the user should select "All Milestones" from the filter dropdown listing within Step 3 of the wizard. Note: the "All Milestones" dropdown filter selection in Step 3 of the wizard will provide only those milestones contained in the dataset determined by the user's Step 2 filter selection.*

After selecting the desired Step 2 choices, click "Next".

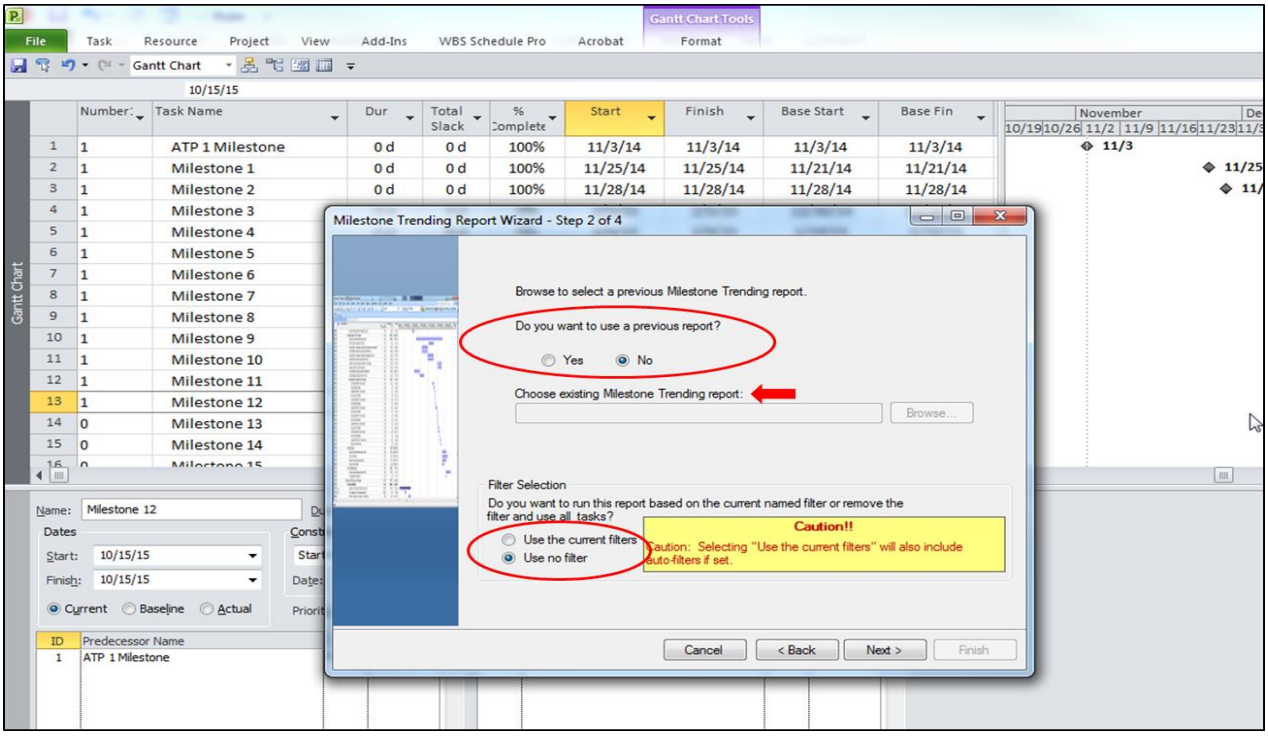


Figure 13-3: Milestone Trending Module Wizard – Step 2

Step 3 produces a wizard dialogue box (see Figure 13-4) that provides users the option to select all milestones or a pre-set, user defined filter that will automatically extract only those desired milestones to be assessed and reflected in the Milestone Trending report. If the "All Milestones" filter is selected then STAT will extract all milestones (including tasks that are marked as milestones) contained in the dataset prescribed by the user's filter selection in Step 2 of the wizard. The milestone listing will then be reflected within the large window in the center of the dialogue box. The user can then scroll through the listing and select the desired milestones individually for reporting. *Note: The Control key must be held down when selecting milestones individually.* It should also be noted that when the user has executed a defined filter prior to initiating this STAT wizard then only the milestones contained in the dataset resulting from that filter will be available to manually select for the Milestone Trending report. Also, as stated above, if a pre-defined filter is available for selection from the drop down list which identifies only the desired milestones, then selecting that filter will automatically extract those items for the output report.

This dialogue box also allows the user to browse and identify the file path location where the Milestone Trending report file will be exported/stored.

After identifying the file path location where the output report is to reside, then select "Next".

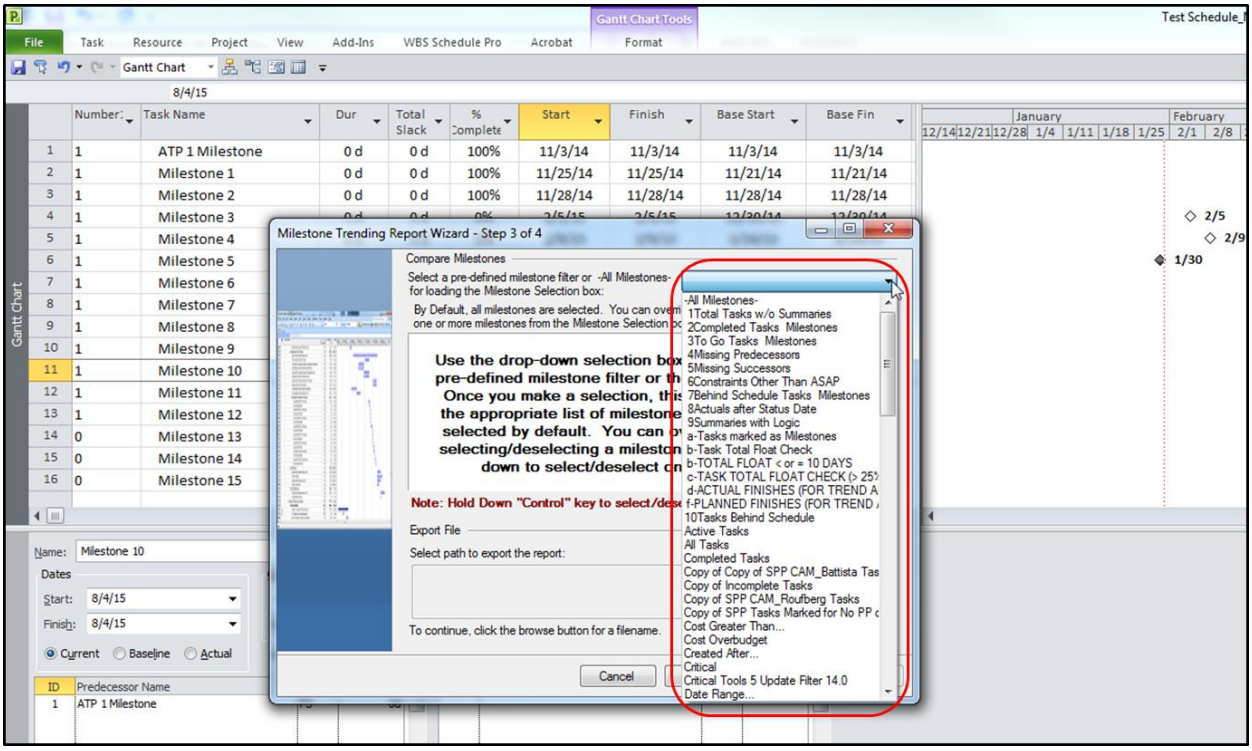


Figure 13-4: Milestone Trending Module Wizard – Step 3

Step 4 produces a wizard dialogue box (see Figure 13-5) that provides important information to the user regarding what versions of Excel must be used for this report. A processing status is also provided to keep the user updated on progress through the various processing steps required to complete the output report.

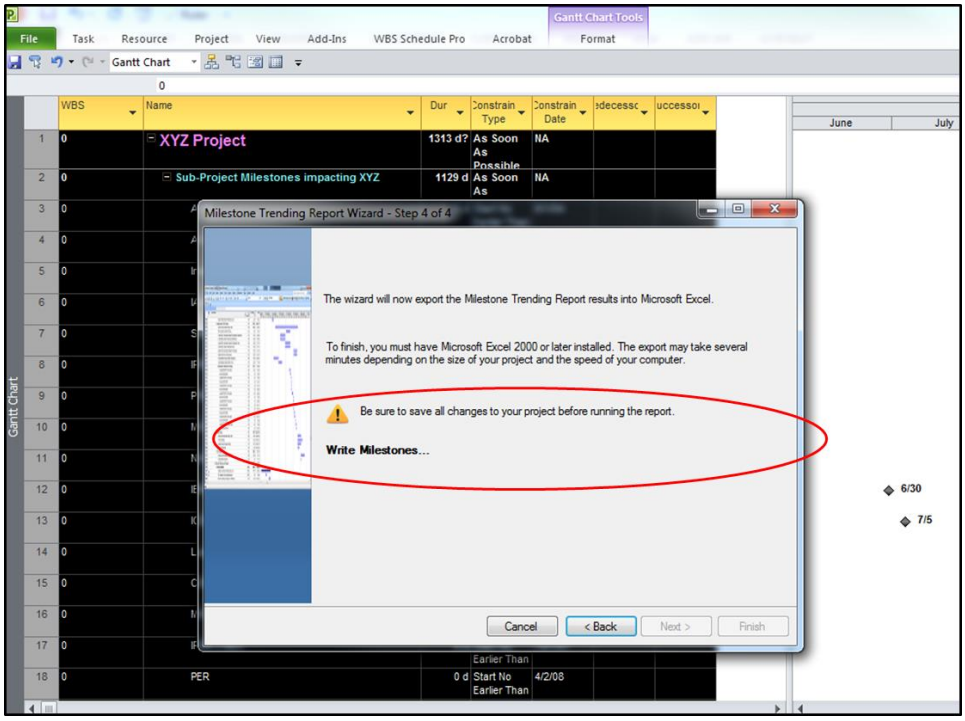
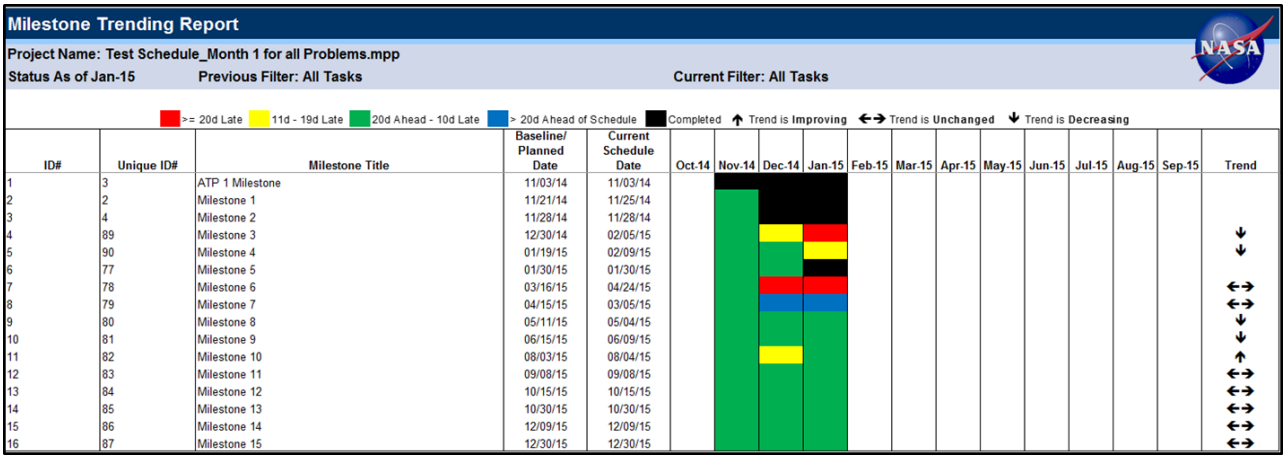


Figure 13-5: Milestone Trending Module Wizard – Step 4

Understanding the Milestone Trending Report Results:

The Milestone Trending report provides the user with objective information relative to baseline achievement and completion trends on major project milestones. During each reporting cycle, the current forecast completion dates for a selected set of key project milestones are compared to their established baseline completion dates. This comparison provides two aspects for analysis (see Figure 13-6). First, a stoplight status indicator clearly tells the user that the milestone is either complete, on schedule, ahead of schedule, behind schedule, or significantly behind schedule. Second, trending arrows are provided to quickly indicate to the user when current forecast completion dates for selected milestones are compared to the prior period data, the results reflect whether current dates are getting worse, improving, or are the same. This trend report provides clear insight into the on-going status of key project events. It can also be very effective for executive management reporting or major project reviews.



Milestone Trending Report

Project Name: Test Schedule_Month 1 for all Problems.mpp

Status As of Jan-15 | Previous Filter: All Tasks | Current Filter: All Tasks

>= 20d Late | 11d - 19d Late | 20d Ahead - 10d Late | > 20d Ahead of Schedule | Completed | Trend is Improving | Trend is Unchanged | Trend is Decreasing

ID#	Unique ID#	Milestone Title	Baseline/ Planned Date	Current Schedule Date	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Trend
1	3	ATP 1 Milestone	11/03/14	11/03/14													
2	2	Milestone 1	11/21/14	11/25/14													
3	4	Milestone 2	11/28/14	11/28/14													
4	89	Milestone 3	12/30/14	02/05/15													↓
5	90	Milestone 4	01/19/15	02/09/15													↓
6	77	Milestone 5	01/30/15	01/30/15													
7	78	Milestone 6	03/16/15	04/24/15													↔
8	79	Milestone 7	04/15/15	03/05/15													↔
9	80	Milestone 8	05/11/15	05/04/15													↓
10	81	Milestone 9	06/15/15	06/09/15													↓
11	82	Milestone 10	08/03/15	08/04/15													↑
12	83	Milestone 11	09/08/15	09/08/15													↔
13	84	Milestone 12	10/15/15	10/15/15													↔
14	85	Milestone 13	10/30/15	10/30/15													↔
15	86	Milestone 14	12/09/15	12/09/15													↔
16	87	Milestone 15	12/30/15	12/30/15													↔

Figure 13-6: Milestone Trending Report Illustration

Section 14: Utilities

Section 14.1: Show in Schedule Utility

Initiating Show in Schedule Utility

The purpose of the Show in Schedule Utility is to provide a way for the user to get the potential problems shown in the detail STAT worksheets filtered to also show within the MS Project gantt chart format so further analysis or corrections can be performed.

To initiate this module, select the Show in Schedule Utility icon from the MS Project toolbar (see Figure 14.1-1).

Clicking on the icon initiates the Show in Schedule Utility Wizard.

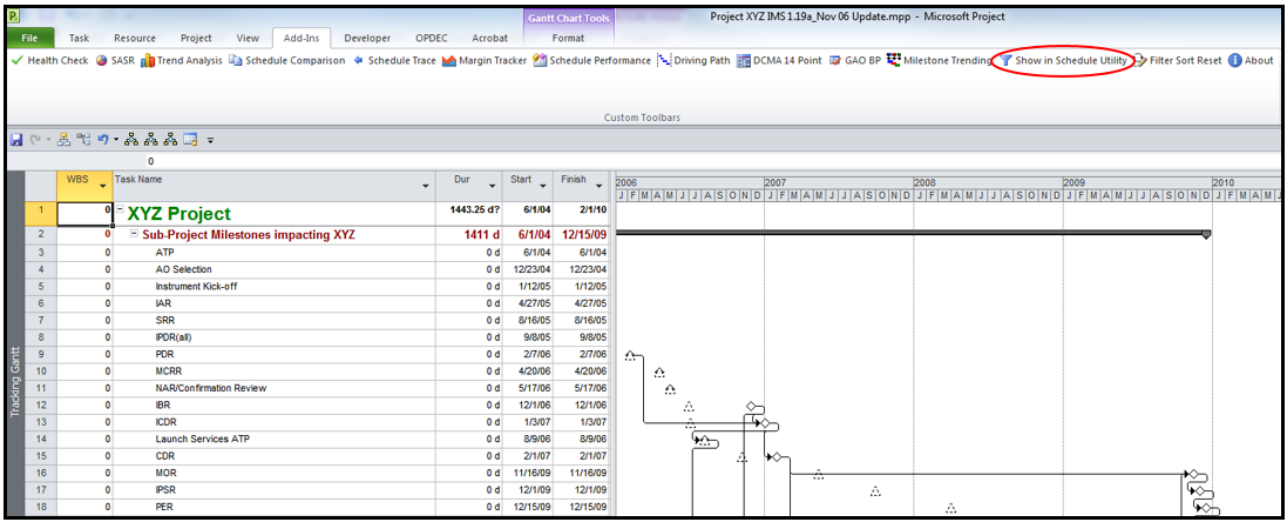


Figure 14.1-1: Show in Schedule Utility Tool Bar Selection

Step 1 of the Show in Schedule Utility wizard will allow the user to select any of the STAT Excel output modules that have worksheets showing lists of activities. To select a file, browse to where the file is stored and select it. After the file is selected the wizard will populate the dropdown with the worksheets that can be selected. From the dropdown select the appropriate worksheet and it will be shown in the box (see Figure 14.1-2). The final selection in this step is the selection of the field to be marked for filtering. The default is the "Marked" field but any of the number fields can be selected from the dropdown (see Figure 14.1-3). Caution should be exercised in selecting this field because any data that is stored in this field will be erased. If one of the number fields is selected and there is a formula in the field an error message will pop up and the formula will need to be removed or another field selected.

Click the Next box to proceed.

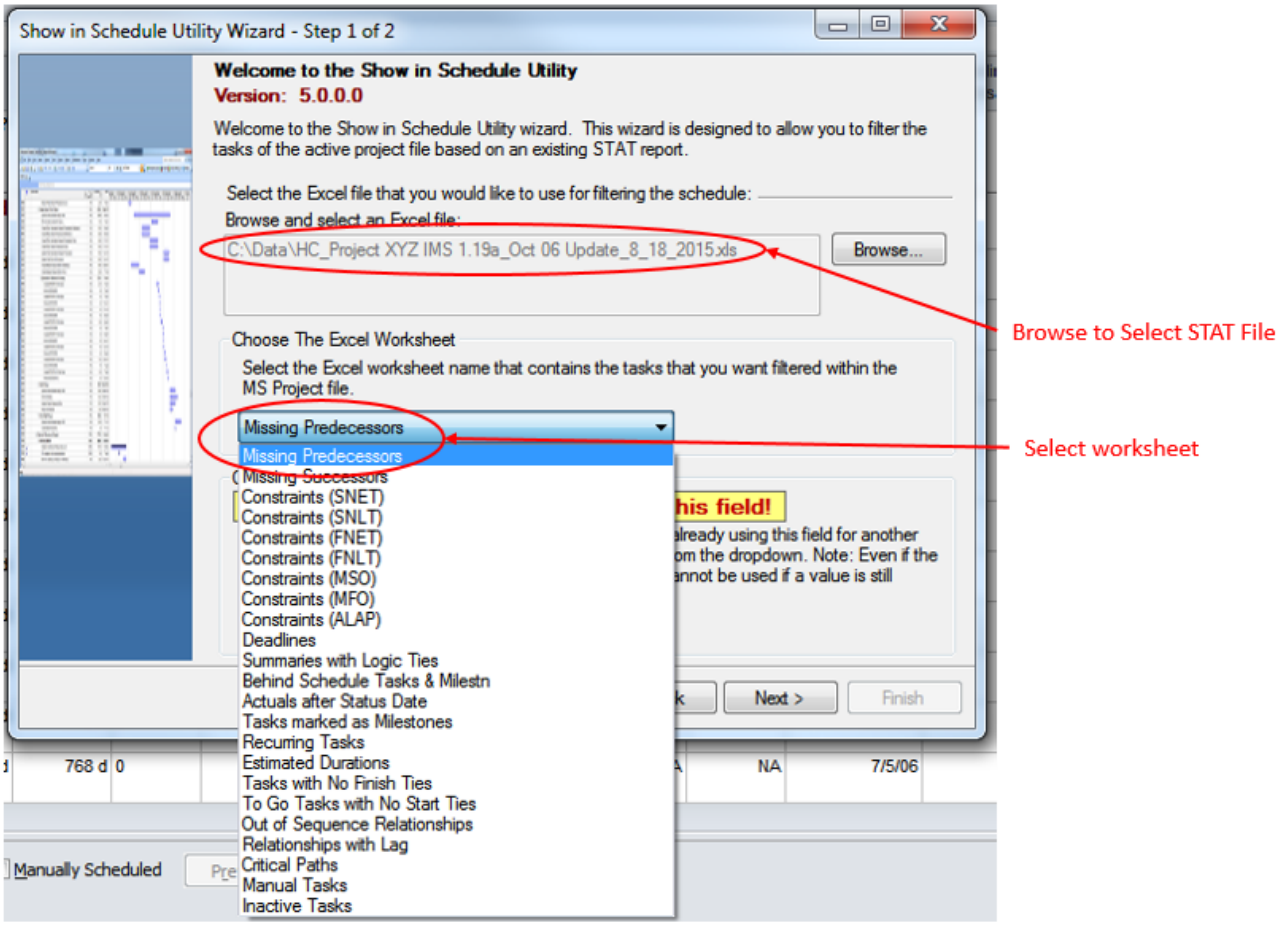


Figure 14.1-2: Show in Schedule Utility Step 1, Part 1

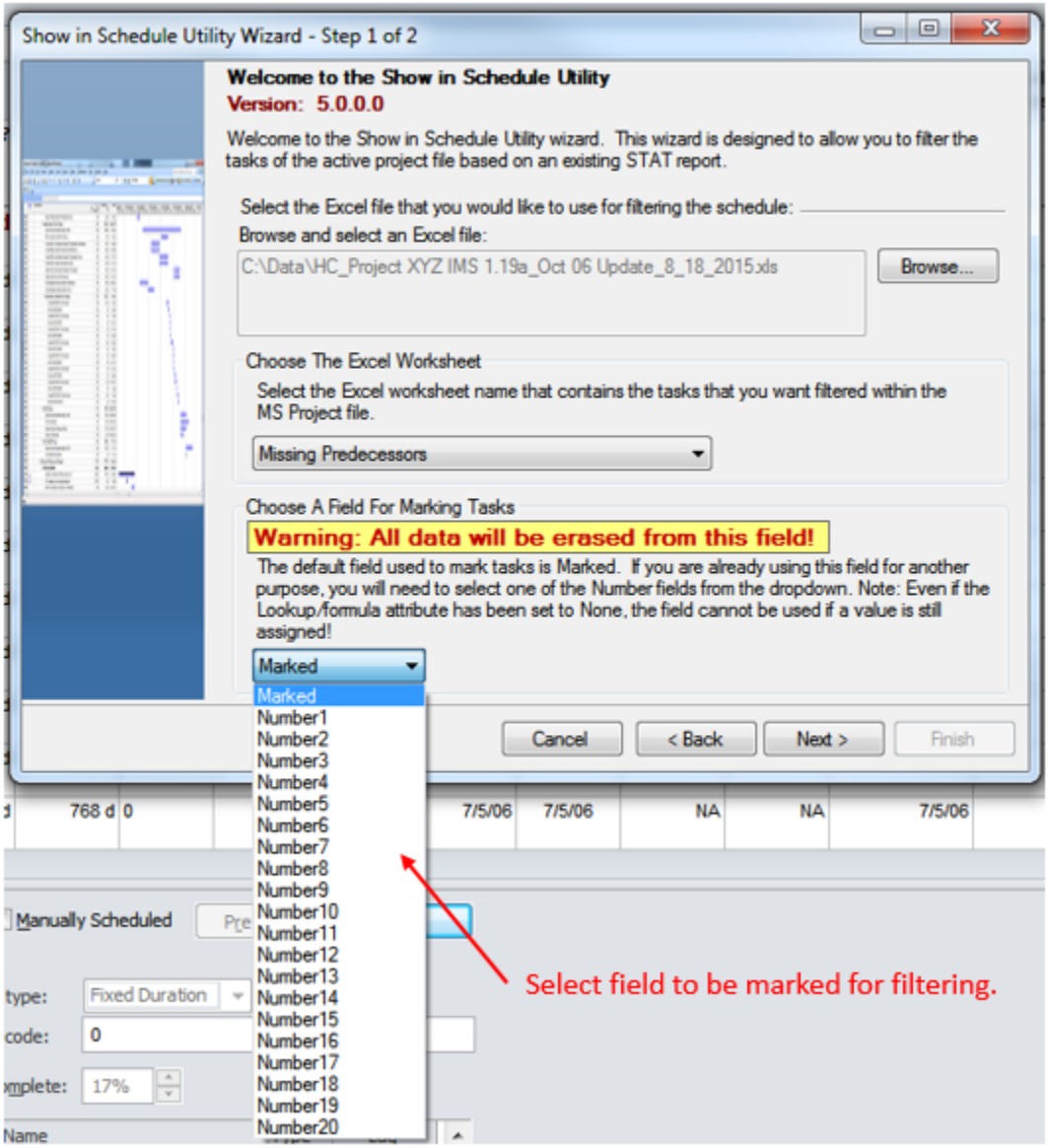


Figure 14.1-3: Show in Schedule Utility Step 1, Part 2

Step 2 of the Show in Schedule Utility wizard dialogue box (Figure 14.1-4) provides the option to back up and make changes or click the Finish box to mark the activities in the MS Project file and execute a filter to show only the activities listed on the worksheet.

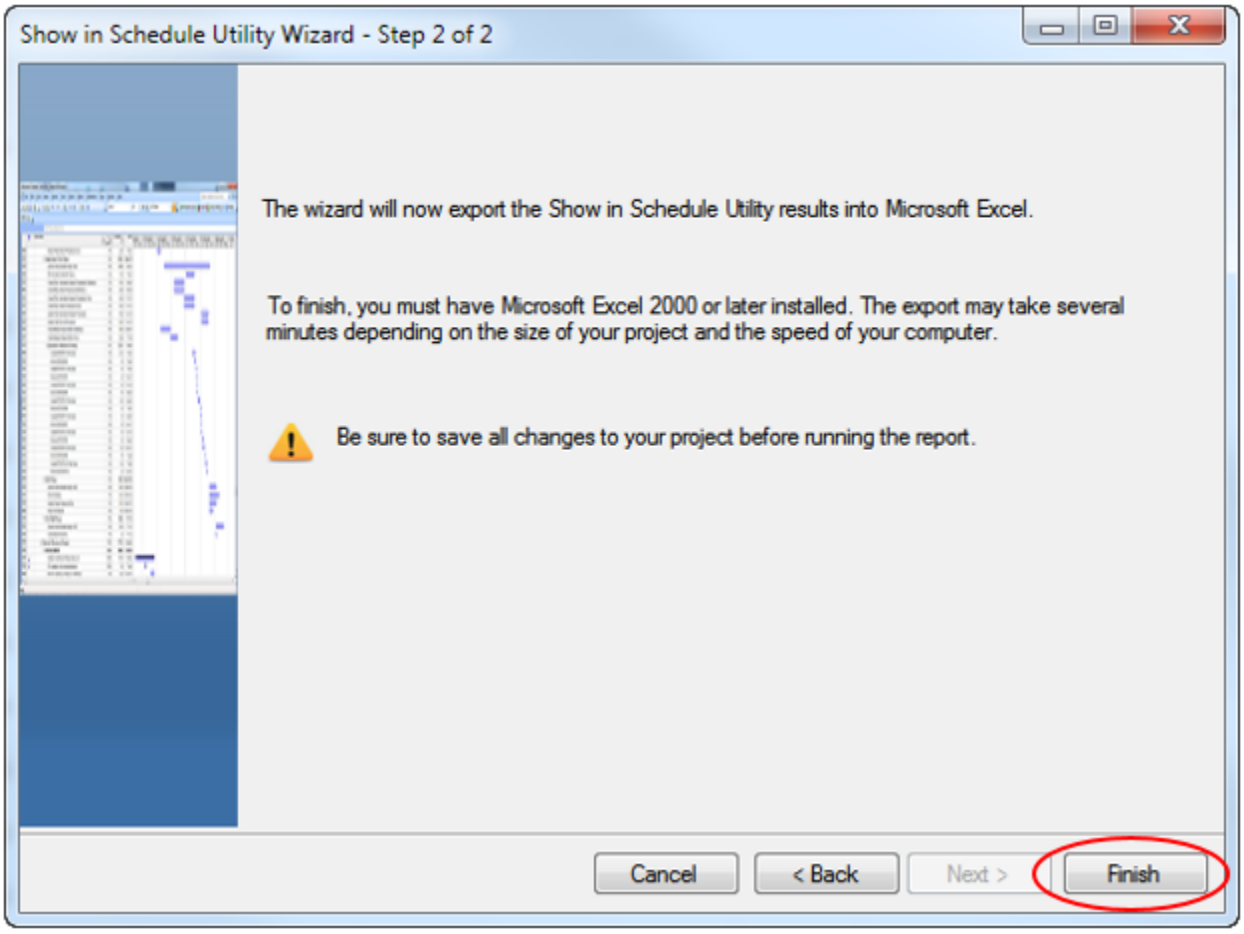


Figure 14.1-4: Show in Schedule Utility Step 2

Show in Schedule Utility Results

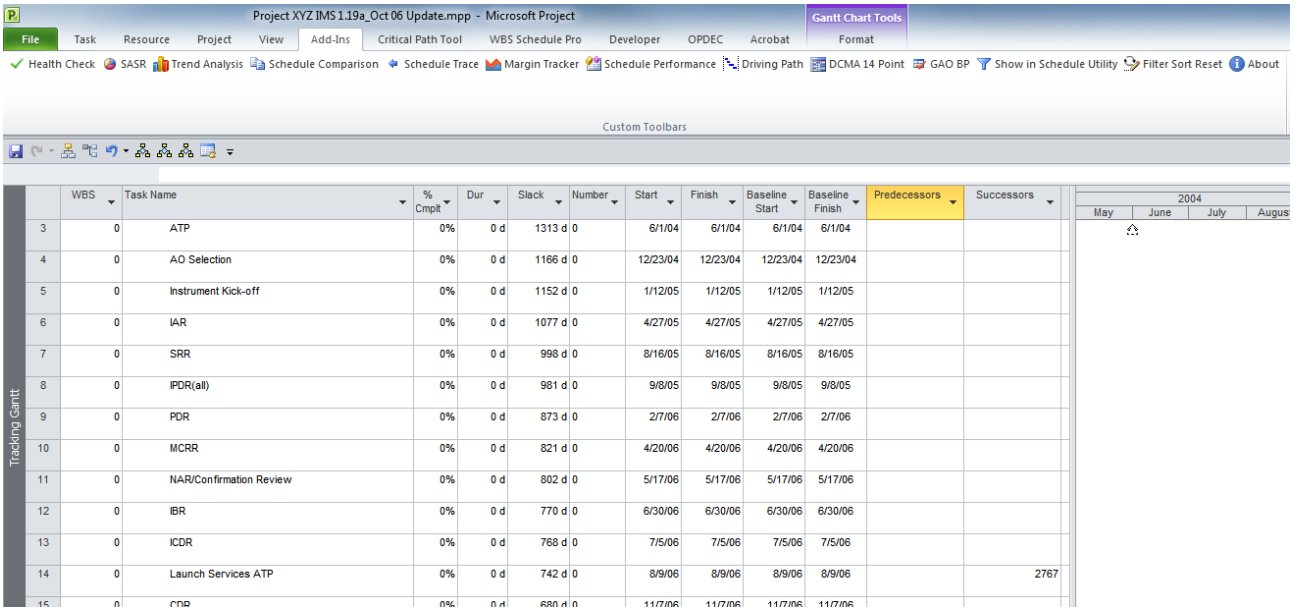
Figure 14.1-5 shows a partial list of the activities missing predecessors from the Health Check. Figure 14.1-6 shows a partial list of the results in MS Project.

Missing or Inactive Predecessors Report

Return to First Page

ID	Unique ID	Name	Start	Finish	Project
3	427	ATP	6/1/2004	6/1/2004	Project XYZ IMS 1.19a_Oct 06 Update
4	419	AO Selection	12/23/2004	12/23/2004	Project XYZ IMS 1.19a_Oct 06 Update
5	665	Instrument Kick-off	1/12/2005	1/12/2005	Project XYZ IMS 1.19a_Oct 06 Update
6	666	IAR	4/27/2005	4/27/2005	Project XYZ IMS 1.19a_Oct 06 Update
7	667	SRR	8/16/2005	8/16/2005	Project XYZ IMS 1.19a_Oct 06 Update
8	668	IPDR(all)	9/8/2005	9/8/2005	Project XYZ IMS 1.19a_Oct 06 Update
9	669	PDR	2/7/2006	2/7/2006	Project XYZ IMS 1.19a_Oct 06 Update
10	670	MCRR	4/20/2006	4/20/2006	Project XYZ IMS 1.19a_Oct 06 Update
11	671	NAR/Confirmation Review	5/17/2006	5/17/2006	Project XYZ IMS 1.19a_Oct 06 Update
12	672	IBR	6/30/2006	6/30/2006	Project XYZ IMS 1.19a_Oct 06 Update
13	673	ICDR	7/5/2006	7/5/2006	Project XYZ IMS 1.19a_Oct 06 Update
14	681	Launch Services ATP	8/9/2006	8/9/2006	Project XYZ IMS 1.19a_Oct 06 Update
15	674	CDR	11/7/2006	11/7/2006	Project XYZ IMS 1.19a_Oct 06 Update

Figure 14.1-5: Missing Predecessors from Health Check worksheet (Partial List)



	WBS	Task Name	% Cmplt	Dur	Slack	Number	Start	Finish	Baseline Start	Baseline Finish	Predecessors	Successors
3	0	ATP	0%	0 d	1313 d	0	6/1/04	6/1/04	6/1/04	6/1/04		
4	0	AO Selection	0%	0 d	1166 d	0	12/23/04	12/23/04	12/23/04	12/23/04		
5	0	Instrument Kick-off	0%	0 d	1152 d	0	1/12/05	1/12/05	1/12/05	1/12/05		
6	0	IAR	0%	0 d	1077 d	0	4/27/05	4/27/05	4/27/05	4/27/05		
7	0	SRR	0%	0 d	998 d	0	8/16/05	8/16/05	8/16/05	8/16/05		
8	0	IPDR(all)	0%	0 d	981 d	0	9/8/05	9/8/05	9/8/05	9/8/05		
9	0	PDR	0%	0 d	873 d	0	2/7/06	2/7/06	2/7/06	2/7/06		
10	0	MCRR	0%	0 d	821 d	0	4/20/06	4/20/06	4/20/06	4/20/06		
11	0	NAR/Confirmation Review	0%	0 d	802 d	0	5/17/06	5/17/06	5/17/06	5/17/06		
12	0	IBR	0%	0 d	770 d	0	6/30/06	6/30/06	6/30/06	6/30/06		
13	0	ICDR	0%	0 d	768 d	0	7/5/06	7/5/06	7/5/06	7/5/06		
14	0	Launch Services ATP	0%	0 d	742 d	0	8/9/06	8/9/06	8/9/06	8/9/06		2767
15	0	CDR	0%	0 d	680 d	0	11/7/06	11/7/06	11/7/06	11/7/06		

Figure 14.1-6: Activities with Missing Predecessors in MS Project (Partial List)

Section 14.2: Filter Sort Reset Utility

Initiating Filter Sort Reset Utility

The purpose of the Filter Sort Reset Utility is to provide the user with a quick way to reset filters and sorts on a project. Initiating this module will remove all filters and sort the schedule by ID. This utility can be used to reset the Driving Path results shown in MS Project or the results from using the Show in Schedule Utility.

To initiate this module, select the Filter Sort Reset icon from the MS Project toolbar (see Figure 14.2-1). Clicking on the icon initiates the process and displays a popup box that explains what is about to occur and gives the user the option to Cancel or continue by clicking OK. Clicking OK will remove all the filters and sort the schedule by ID.

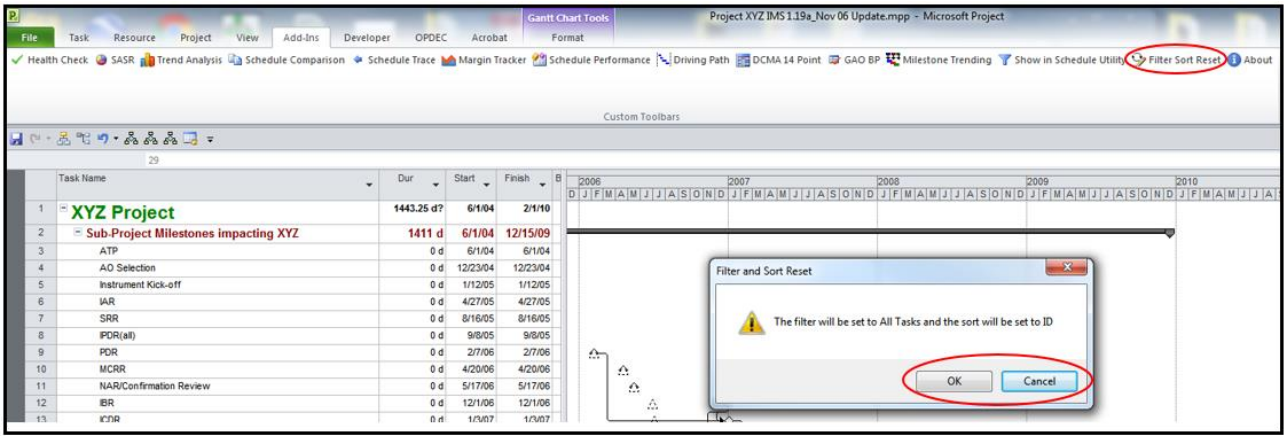
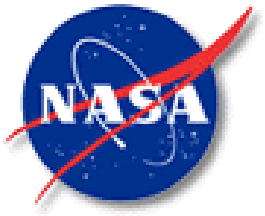


Figure 14.2-1: Filter Sort Reset Utility Tool Bar Selection

National Aeronautics and Space Administration



www.nasa.gov